

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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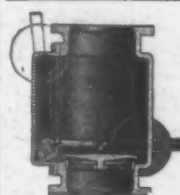
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# THE IRON AGE

THURSDAY, MAY 8, 1902.

## Steel Chimney Erection.

Wm. Stanton, writing to the *London Engineer*, says: We are erecting five steel chimneys 125 feet high by 5 feet 3 inches in diameter, for the British Westinghouse Company at Trafford Park. We have just about finished the fourth stack, and as the method of erection is on somewhat new lines for this class of work I venture to send you a brief account of the operations. On the top of the cast iron bed plate prepared to receive the chimney we put up a square frame of scaffold poles and braced them horizontally and diagonally. The two main poles would average about 9 inches in diameter, and were 55 feet high; at the top of each of these poles we

quired on the framing, which answered the double purpose of bracing and scaffolding.

As far as I know this is the first time that steel chimneys 125 feet high have been put up in this manner. We were told many a time about the risk of having the stack down when we were almost finished; but while admitting the risk, I am inclined to think success justifies the means.

## A Novel Concrete Mixing Plant on the New York Subway.

On the New York Rapid Transit Subway at 146th street and the Boulevard is a novel arrangement for rap-



A NOVEL CONCRETE MIXING PLANT ON THE NEW YORK SUBWAY.

hung a set of tackle leading into two crabs. Then we put the top ring of plates over the flue under the frame; after riveting the vertical seam we put a sling round the ring and hooked the tackle on and hoisted the ring up 5 feet; then we put No. 2 ring into its place and riveted the horizontal seam, and so on until the top of the stack reached the top tackle blocks on the framing. We then had to lower the slings and attach temporary guy ropes to the top of the stack to keep it vertical while we were lifting for each ring; at the last lift for the bottom ring we had 70 feet of the chimney above the sling and only 50 feet below.

The advantages of the method are that the assembling and riveting are done on the ground, and you can see that the work is done properly; it also does away with the need for scaffolding, except such as was re-

quired for idly and economically mixing the concrete required on the work. At this section the excavation is carried as an open cut through rock. The floor and side walls are built of concrete, as shown in the first engraving. The roof will be composed of steel beams supported upon the side walls and a center row of steel columns, the spaces between the beams being of arched concrete.

The first work is the finishing of the concrete floor. Upon this is then laid a loose wooden platform where the concrete, having been mixed in proper proportion above, is wetted. Just above this is a movable deck bridge which spans the excavation. The ends rest upon wooden beams placed near the edge of the cut, so that the entire structure can be moved forward as the work advances. Upon this bridge are dumped the sand, stone and cement. The carts are driven upon the bridge, in a

direction away from the observer, Fig. 2; they then turn to the left and pass along the side of the excavation to the temporary street bridge, also shown in the same engraving. The concrete, mixed dry, is then shoveled into the chute shown in the center of the first engraving. The bottom of this chute is provided with a gate or slide so that the dry concrete can be dumped on the lower platform as required. Water is here added from barrels placed on the bridge above.

As indicated in the first half-tone, a braced sheathing of plank is arranged along the side of the excavation in line with the face of the wall to be built. The space between this and the rock is then filled with concrete. It will be noted that the concrete is moved but a few feet from the place where the material is first dumped to the wall.

### Oil Fuel and Oil Burners.

BY EGBERT P. WATSON.

With the discovery of new oil fields in various parts of the world interest in the use of liquid fuel has been revived. Many large steamship lines have adopted it

formidable rival. Notwithstanding the views of "well-known scientists," whose names are not given, there is no positive knowledge of the extent of the new oil fields, and as soon as the supply is restricted the price will go up until coal will be the cheaper.

In any event, the oil reserve underlying this country will have to be of incredible extent in order to compete with coal for a long term of years. The consumption of the latter is enormous, so great that it would take a very large number of even 300-barrel daily spouters to appreciably lessen its consumption. The spouters aforesaid come into action at once upon striking the oil veins, and cease flowing as suddenly as they commenced, while coal mines continue prolific through decades. It would seem better to make haste slowly in deciding between coal and oil fuel, for although the supply of the latter is adequate to the present demand, it is more than doubtful if it would continue if there was a general call for it.

Many, if not most, of the difficulties and dissatisfaction with the results obtained by using oil as fuel arise from defective burners or from neglecting them. The popular idea of a burner is one that acts as promptly as a household lamp; but even this gives no light unless it is properly managed. If the wick is turned too high



Fig. 2.—View of Concrete Mixing Platform and Bridge.

extensively and are establishing depots of supply in various ports. Texas oil can be had so cheaply at present that experimental trials have been made with it in lieu of coal by the United Fruit Company, running a line of vessels from New Orleans to the Belize. It was a first test, but proved entirely satisfactory from every point of view. Not only was the round trip the fastest ever made by the company's steamers, but it was also the cheapest. Six firemen were dispensed with and the actual consumption of oil was 850 barrels, as against 218 tons of coal for a similar service. The company are, it is reported, about to adopt oil fuel upon all of their vessels and set up tanks at both ends of the run to supply them. The saving annually is estimated at \$9250 for each ship.

It is somewhat anomalous, in view of all the circumstances and previous experience with oil as fuel, that it has not been more generally adopted in years gone by. One reason has been the uncertain supply. Another is the high price of oil as compared with coal in certain places remote from mines. Still another is the unsatisfactory results obtained from oil fuel at different times, on one day giving no trouble and on others nothing could be done with it. This last is by no means unusual, but it is nearly always caused by water in the oil, either as it came from the well or getting into it subsequently. However this may be, oil fuel at present prices is likely to be extensively used, but in comparison with the quantity of coal in sight and known to exist it is still very doubtful whether it will become a

there is much smoke and no light, owing to an excess of oil. It is the same with oil burners designed to furnish heat instead of light, for the majority of them, or a large number, are run with a red-yellow flame. If the furnace is filled with this the burner is supposed to be doing its best, but there may be a sea of flame and comparatively little heat. A properly designed and managed burner affords a blue-purple flame and no smoke whatever, the oil vapor only being burned, as with the so-called wickless blue flame oil stoves in domestic use. There are a great many burners for fuel oil in the market, and those who are interested should take pains to see that they get a practicable one before condemning the fuel itself.

**Drawback on Carpet Sweepers.**—Under date of April 25, 1902, the United States Treasury Department issued the following decision: "On the exportation of Bissell carpet sweepers manufactured by the Bissell Carpet Sweeper Company of Grand Rapids, Mich., from imported tin plate of IX quality, 13 x 19 in size, a drawback will be allowed equal in amount to the duty paid on the tin plate used in the manufacture, less the legal retention of 1 per cent. The quantity of the material so used shall be determined by allowing 123½ square inches of tin plate for each exported sweeper."

English newspapers report a sale of 5000 tons of Seaton-Carew Bessemer pig of guaranteed analysis for shipment to this country.



## Strengthening the Bankruptcy Law.

### The Ray Bill Expected to Pass.

WASHINGTON, D. C., May 6, 1902.—The House Judiciary Committee, which, as stated in *The Iron Age* last week, has favorably reported the so-called Ray bill intended to strengthen the Federal bankruptcy law, called up the measure on the 2d inst., and after brief consideration secured for it an advantageous position in the legislative programme, which will doubtless result in its passage by the House within the next fortnight. That this bill will not be permitted to pass the House without a hard fight is evidenced by the fact that no less than four members of the committee have joined in a minority report not only protesting against the passage of the amendatory bill, but urging as a substitute a measure absolutely repealing the Federal statute.

The four minority members of the committee who have united in the adverse report referred to are Messrs. Clayton of Alabama, Fleming of Georgia, De Armond of Missouri and Smith of Kentucky. The geographical distribution of this minority is significant in view of the fact that the sections of the country which these members represent were loudest in the demand for a Federal statute. No one would contend, however, that what was desired in these districts was a purely voluntary Federal law which would permit debtors to slough off their financial obligations as often as desired, leaving their creditors without recourse, and helpless even to protect their interests when their debtors' insolvency had become a matter of public notoriety.

#### The Minority Report Assails the Bill.

At the outset of the minority report the Federal statute is assailed on the ground that it was drawn solely in the interest of the creditor class, although it is a well-known fact that the sharpest critics of the present law have unanimously contended that it made the path of the debtor far too easy, and encouraged reckless business methods by holding out the prospect of an unlimited number of discharges whenever a debtor might be overwhelmed by carelessly incurred financial obligations.

The minority makes a point of the fact that during the 114 years since the adoption of the Constitution Federal bankruptcy laws have been in force but 25 years, and it is argued from this point that "the American people have not heretofore favored a permanent bankruptcy system, and we do not believe that they now favor it." The minority report assails the integrity of Chairman Ray's digest of the replies received to his circular letter described in *The Iron Age* a week ago, which was sent broadcast throughout the country to thousands of business men of both debtor and creditor classes.

"It may be," ingeniously suggests the minority report, "that nearly all the circular letters were sent to wholesale merchants and jobbers, bankruptcy lawyers, referees in bankruptcy, and other court officials interested in the cost features of the bankruptcy law. In his report the chairman does not tell how few replies he received to his circular letter. He assures us that only 10 per cent. of the replies received opposed the retention of the law. In coming to his conclusion as to the popularity of the measure, it may be that the chairman was largely convinced by the silence of the people addressed, as we are led to believe by his statement in the circular letter that 'In case you [the recipient of the letter] do not return the paper as requested, it will be assumed that you are satisfied with the existing conditions under the present national bankruptcy law.'"

"We have not been told that the unfortunate debtor's side was presented. The man who has gone voluntarily into bankruptcy and made an honest showing has been, in some degree, considered in this legislation; but it does seem to make the unfortunate debtor who has been put into involuntary bankruptcy when he was conducting a going business, and who thereby has had his business, credit and character ruined, subject to every inquisitorial method and harsh measure that commercial lawyers and hard hearted creditors can suggest. The drastic provisions of this bill show that in the minds of at least

some of its promoters every involuntary bankrupt is deemed to be a thief and a scoundrel from the very inception of the proceedings against him. The resort to this unusual remedy is tantamount to an indictment against the unfortunate debtor. It is no answer to say that he may have a jury trial, under certain conditions, and thereby have his innocence established. He has already been ruined and branded, and there is no adequate remedy, no reparation. But what cares the rapacious creditor for the ruin of a hundred innocent men, so that he may at some time catch one dishonest man and force him to disgorge assets that should be applied to his just debts?"

#### A Prejudiced Point of View.

The prejudiced point of view of the minority is fully disclosed by the charge made in the report that the present law has operated solely in the interest of the creditor class. "We can very well understand," says the report, "why some wholesale dealers and jobbers, bankruptcy lawyers, referees, trustees, marshals and clerks of courts might desire the retention of the present bankruptcy law, and favor certain amendments. We think it fair to say that some wholesale dealers and jobbers favor such retention and some of the amendments proposed, because they would like to use the law more and more as a collection machine, and we can understand why referees and others who are interested in the fees from the bankrupt estates desire the enactment of these amendments increasing their compensation.

"But we admit that these should not be our controlling reasons, however just may be some of those demands or suggestions, when we are called upon to legislate for the whole people. Even the improvement of a system essentially bad is not as good as its abolishment. If we ought to be slow about relieving unfortunate debtors, we ought to be equally slow about conferring new and harsh remedies upon exacting creditors through the medium of extraordinary powers given to the Federal courts and court officials whereby any of the debtor class may be unjustly oppressed or harassed. We ought to legislate with the idea uppermost in our minds that the creditor class in our country is not, as a rule, more honest and just and more to be trusted with power and authority than the debtor class, and that the interests of the one are no more worthy of legislative consideration than those of the other."

It is probable that the arguments employed by the minority in favor of repealing the present statute will appeal to a certain class of members of the House. The sympathetic appeal in the interest of the "poor debtor" will doubtless be utilized to the utmost, and no effort should be spared by those who desire the retention of the present law to convince members and Senators from all parts of the country of the real sentiments of the business community, which have been clearly shown to be not only in favor of continuing the bankruptcy law, but also of amending it as provided by the Ray bill.

W. L. C.

**William Swindell & Brothers.**—The statement has been printed in another journal that the American Furnace & Machine Company of Pittsburgh had been incorporated under the laws of New Jersey, with a capital stock of \$100,000, and would take over the successful business of William Swindell & Brothers, engineers and contractors, with offices in the German National Bank Building, Pittsburgh. William Swindell & Brothers deny that they have any connection with the American Furnace & Machine Company, or with James H. and James D. Swindell, who are the incorporators of the American Furnace & Machine Company. William Swindell & Brothers are still in business in Pittsburgh, and are a distinct corporation, with William Swindell as president, John D. Swindell treasurer and Edward H. Swindell secretary. This firm have no connection whatever with the new company and wish this to be distinctly understood by the trade. William Swindell & Brothers have a great deal of work on hand and are building quite a large number of their Swindell continuous water seal gas producers in different parts of the country.

## Lake Iron Ore Matters.

DULUTH, MINN., May 3, 1902.—The iron ore shipments of April did not reach expectations, amounting to not more than 1,650,000 tons from upper lake ports. This is excellent, however, and gives a long start for the season. The month of May opens with the situation in fine shape for a large business, except for the feared congestion at lower lake docks. It is strange that with the warnings these docks gave last year of their incapacity to care for the business that might be looked for this season more facilities were not provided. The addition of a few unloading machines and extra tracks, even of a few hundred feet additional length of frontage, cuts little figure when there are several million tons more to be handled and docks were congested last year. There is trouble with the rolling stock of lower lake roads, and the ore will not get away to furnaces as fast as it should to make matters easy.

If anything was needed to emphasize what this correspondence has pointed out for months—that there were too many ships this year for the business of the lakes—it is the result of turning tonnage into channels aside from ore by independent shippers who are endeavoring to maintain the rates. They have put vessels into wheat and have brought grain rates to a parity with ore at 55 cents a ton; they have put them into coal and demoralized the trade, and they have now nothing to show for their activity. In the meantime the United States Steel Corporation are steadily taking what vessels they require at the rate they decided to make and adhere to at the commencement of negotiations this season. Nothing independent owners could do would be so disastrous to their own rates as turning ships from ore into grain. In ore the tonnage is so great that the addition or taking off of a few ships makes no difference, while the gross grain tonnage is, comparatively speaking, of such minor consequence that a few vessels added to a market already overstocked bear down rates seriously. There is very little being said now of new shipping for the lakes, but what the coming season may bring out cannot, of course, be foretold.

### The Mesaba Range.

The Eastern Minnesota road is building, or will build this season, spurs and branches to no less than nine new mines. Among these are the Kinney property, recently sold to the Deering Harvester Company. This will be a branch 10 miles long, running off the branch now leading to the Stevenson mine. It is reported that this new mine will be quite a shipper late this year, but this is not probable. Even though Joseph Sellwood is to have management of the property, it will be a long time before shipment can commence. Spurs are also to be made to the North and South Day mines, at Hibbing, called now by the Fay Exploration Company the Laura and Winnifred. The former shows some very nice Bessemer ore; the latter is a small deposit of good non-Bessemer. The Webb, adjoining and south of the Winnifred, will be reached by tracks of the Eastern a little later. The Columbia, adjoining the Webb and being opened by the Sellwood interest, will be reached by this road shortly. The same interest is opening the Morrow mine, which is a corner of the Pillsbury ore body, and the Pearce, which is a corner of the Caisholm deposit. Both are small and both will be shippers to some extent this season. The Grant, near Buhl, will also be reached by the Eastern road. So will the Wacouta, just east of Mountain Iron, and also in all probability the Croxton, another new property. The Elizabeth, just south of Hibbing, is being further explored, but will not become a shipper for another year. Other roads are building lines to the Pitt, the Minorca, the Stevens and the Shengango. The Eastern will get the Republic Iron & Steel Company's ore from their new Kinney, in 14-58-19.

### The Vermillion Range.

Considerable work is promised for the Vermillion range. This follows the taking of new lands by the Oliver Iron Mining Company, and is quite largely owing to the settlement of legal difficulties at the Eaton-Merritt

tract and the old McComber mine. This latter has already been entered by D. E. Woodbridge of Duluth. He is rapidly getting the water out of the old workings and will have the property thoroughly examined by competent engineers. The Oliver Iron Mining Company will explore in the vicinity of the McComber during the year, and some exploration is promised east from Ely, in a region distant from the railways.

### The Gogebic Range.

A good deal of work is being done on the Penokee range, west of the hitherto productive part of the Gogebic. This work extends from town 45-1 east to town 44-3 west. At Upson the Schlesinger syndicate are working steadily and with encouraging signs, it is said. It is quite probable that a mine will be encountered there. Near Mellen, at the west end of the belt, work is going on with some encouraging symptoms. At the eastern end of the Gogebic some exploration is also under way, but work that looked satisfactory some months ago is now not so favorable.

### The Marquette Range.

As depth is reached at the new Maas shaft of the Cleveland Cliffs Iron Company in the Negaunee district the work becomes very slow. Now they are sinking but a few inches a day; in fact, since the middle of February the shaft has gone down but about 12 feet. Sand boils up occasionally, but not so much as a short time ago. The workmen are able to stay at the bottom of the shaft and are not greatly troubled by water or sand. That the immense weight of shaft and timbers, loaded as they are with iron, does not sink faster is a remarkable thing. A bed of clay will soon be reached. The old Negaunee mine is now shipping as fast as possible and will make a record breaking output this year, considering the obstacles encountered lately. The volume of ore shipments from Negaunee and Ishpeming is very large, heavier than at the corresponding date after the opening of navigation last year. Considerable ore is going through to Escanaba. At the Volunteer mine, Cascade range, which was taken not long ago by the Donora Mining Company (Union Steel Company), they are now raising about 150 tons of ore daily, and will increase this gradually. The same company are also doing work at other points nearby. On the western Marquette, in the vicinity of the American and Dexter mines, much work is in progress and contemplation, and several of the old mines will be pumped out, examined carefully and probably reopened and developed extensively.

### The Menominee Range.

In the Iron River district of the Menominee range Duluth parties are working near the Hiawatha mine and are making considerable progress, with some excellent indications. The Hiawatha mine itself is making a fairly large output and will be developed considerably this year, it is reported. At the Mansfield they are sinking the new shaft in diorite and having a very slow, hard job of it. The twelfth level is being opened, and when the new shaft is ready for business the mine can be a large producer. The old shaft will be sunk another level at once. At the James property the shaft is down 375 feet. It will be carried to more than 500 feet and drifting will be undertaken. The shaft has been sunk at the rate of 3 feet a day for some weeks. The Fogarty land, near Iron River, has been examined this week by agents of the Cleveland interest and may be taken for exploration. Shafts are being put down on the Caspian and Kinney properties and machinery plants are being installed at both places.

### The Michipicoton Range.

Orders have been given to push the Algoma Central & Hudson Bay road as fast as possible to the Helen and Josephine mines of the Michipicoton range, and about 4000 men will be worked along the lines this year, with the expectation of making connection with the mines by autumn. Construction gangs are working about 70 miles north from the Sault and the road will be finished to Agawa, 72 miles out, by midsummer. The Clergue interests are said to have great hopes of the Josephine mine, which they are now commencing to develop.



Engineers are starting the work of preliminary surveys for the Nipigon Railway, a Canadian line heavily assisted by the Government, and designed to run up the east side of Nipigon River from Lake Superior to Lake Nipigon, about 80 miles, and thence northeasterly to Albany River. It will cut across the region where most of the large steel making interests of the continent that carry on explorations have had agents and experts for the past year or two. The Oliver Iron Mining Company had confidential men in this region three years ago. The road is being built under a concession to a paper and pulp concern, but will be available, of course, in case iron is found there. Much in the way of float indications has been found, but little else so far. D. E. W.

## Prospects of the Reciprocity Treaties.

### All Treaties But Two Favorably Reported.

WASHINGTON, D. C., May 6, 1902.—Contrary to general expectations, the Senate Committee of Foreign Relations, by a majority of a single vote, has reported to the Senate with a favorable recommendation the reciprocity treaties with France, with Great Britain, covering the Turk's and Caicos islands, Bermuda, British Guiana and Barbados, and with Nicaragua and Ecuador. The treaties with the Argentine Republic and Jamaica have been adversely reported.

#### The French Treaty and Its Powerful Enemies.

While the French treaty has thus been saved from defeat at the hands of the Senate Committee it cannot be said that its parliamentary position has been materially improved, especially when it is understood to what devices its friends were obliged to resort in committee to prevent an adverse report, and when it is known that Senator Aldrich, the tariff leader of the majority, stands ready whenever the convention is called up to move its reference to the Finance Committee for the purpose of encompassing its defeat. When the vote was taken in committee but 9 of the 13 members were present, and of these but 3 Republicans, Senators Cullom, Foraker, Spooner, and one Democrat, Senator Bacon, voted for the treaty, while 4 Republicans, Senators Lodge, Frye, Clark and Kean, and one Democrat, Senator Morgan, voted against it. This adverse vote of 5 to 4 would have beaten the treaty but for the fact that an agreement was reached under which those absent members who had expressed a definite preference should be counted, and on this understanding Senators Money and Rawlins, Democrats, were counted for the treaty, giving it a majority of one. Senators Fairbanks, Republican, and Bailey, Democrat, were also absent, but having been noncommittal were not recorded.

#### Special Reasons for Reporting the French Treaty.

That but three Republican Senators were induced to support the French treaty is especially significant in view of the fact that a number of arguments appealing with much weight to members of the majority at this time were skillfully used by the advocates of ratification. The suggestion was made, in the first place, that the French treaty presented a question of great international importance in view of the generally unfriendly attitude of Europe with regard to American commercial expansion, and, therefore, that responsibility concerning it should not rest with a single committee of the Senate, but with the entire body. Should the treaty be reported adversely there would be no occasion for calling it up, whereas a favorable report would still leave the fate of the convention subject to the direct action of the Senate. It was further suggested that a favorable report upon the treaty would result in deferring any retaliatory action on the part of France, while an adverse report might precipitate reprisals on very short notice, and would have an unfortunate effect upon our commercial relations with all the leading countries of Europe, and especially with Russia, which has already promulgated decrees imposing retaliatory duties on American products in return for the imposition by the United States of countervailing duties on Russian sugar.

The friends of the treaty placed their chief reliance

upon the argument that it would be a serious tactical blunder for the Senate Committee on Foreign Relations to reject a reciprocity treaty with France at a time when the Senate Committee on Relations with Cuba was endeavoring to frame a bill providing for reciprocity with that island. It is generally conceded that the administration's plan for making a reciprocal trade arrangement with Cuba, involving reduction in the tariff on Cuban products when imported into the United States, can only be carried out by the employment of every parliamentary device, and it was therefore argued that the wholesale rejection of a series of important reciprocity treaties at this time would greatly embarrass the administration leaders in the Senate, who hope to pass a Cuban reciprocity bill in the face of the strenuous opposition of the House.

#### The Rejection of the French Treaty Merely Postponed.

No attempt was made to conceal the fact that the French treaty lacked a majority in the Senate and required a two-thirds vote for ratification, and this consideration was undoubtedly very potent in inducing certain Senators to vote for a favorable report, which would relieve the committee of further responsibility without materially improving the prospect of favorable action by the Senate. In the face of these circumstances, it will be seen that too much weight should not be given to the action of the committee, and it is the best opinion here that the rejection of the French convention has simply been postponed thereby.

The argument upon which Senator Aldrich will demand reference of the French treaty to the Committee on Finance is that as it makes important changes in the rates of the Dingley Tariff act it will seriously affect the revenues and should, therefore, be considered by the committee responsible for the Government's income. At present the members of the Finance Committee are strongly opposed to the treaty and are disposed to defer to Senator Aldrich's opinion with regard to all details affecting tariff questions. The vote taken on the motion to refer the treaty to this committee will be regarded as a test of strength in the Senate, as all advocates of ratification will be expected to resist such reference as fatal to the convention. W. L. C.

### Drinking Water for Workmen.

B. F. Avery & Sons of Louisville, Ky., describe as follows their experience in furnishing prepared drinking water to their workmen during hot weather, especially those employed in their forging, foundry and other departments where there is intense heat. They take stone jars or kegs holding about 10 gallons of water, filled with water and a small quantity of ice, pack the jar in a barrel with sawdust between the inner and outer vessels. Thus the water is kept cool with a minimum of ice. Each morning they place about ½ pint of oatmeal, rolled oats or any other form of crushed oats in the water. This crushed oats thus used makes the water a remarkable thirst quencher. During the several years that they have thus provided drinking water they cannot recall a case of heat prostration or illness due to excessive drinking of water by men employed in their shops where the heat is great. They also find that this water reduces the appetite for intoxicating drinks, and in general the effects are so excellent that their men are telling it to workmen in other shops and cities. The jar should be emptied and thoroughly cleansed every morning, as the oatmeal sours over night, and, of course, the drinking cup also ought to be scalded and scoured for obvious reasons each day. They believe that the water should be drawn from a spigot, as, of course, from a sanitary view the use of a dipper in the top of the jar is not as it should be, but the oatmeal clogs the spigot or strainer leading to a spigot. It has contributed not only to the comfort of the men, but has permitted them to continue at work when the heat might otherwise have prevented and has greatly reduced the temptation of the men to seek intoxicating cooling drinks. For a few days the oatmeal flavor may not be relished by all of the men, but very soon they find it palatable and are delighted by the relief afforded.

## Scientific and Technical Notes.

P. B. Delaney, whose synchronous multiplex telegraph has been extensively used abroad for many years, has now perfected a remarkably rapid automatic system of telegraphy. It is claimed that 8000 words per minute have been transmitted over a single short experimental line, while 600 to 800 words per minute can be regularly sent over a line several hundred miles long. The sending operators (who need not be located in the central office) use a common Morse key transmitter. The lines which they operate may be run to a central office at one end of the long distance line, where, in place of the ordinary receivers, there may be machines which perforate a narrow tape with small holes corresponding to the usual Morse code. These perforated tapes are fed through the long distance transmitter at very high velocity, one of these latter machines having a capacity equal to the capacity of many operators. At the receiving end of the long distance line there is a receiving instrument which records the Morse signals on a rapidly moving sensitized tape. The messages are transcribed from these records by the necessary number of readers, or the various messages may be forwarded to outlying branch offices by the ordinary method. A great advantage of the system is that the limit to the business conducted over the long distance line is in no way affected by the speed of the operators at either end. If these operators are "slow" a larger number can be employed in occupying the line, and they may be worked on the "piece work" plan. If an attempt were made to send the messages over the long line at very high speed by the ordinary method of transmitting "dots and dashes," the electrical capacity of the line and the necessity of charging and discharging the line between impulses would effectually defeat such rapid transmission. To overcome this difficulty very ingenious features are introduced in the perforating, the transmitting and the recording apparatus. The perforating machine contains two punches. One of these makes a hole near one edge of the moving tape when the sending key is depressed, while the other punch makes a hole near the opposite edge of the tape when the key is released. The distance between these two perforations—measured along the line of the tape—corresponds to a dot, dash or long dash, as the case may be, of the Morse code. In the passage of the tape through the transmitter the perforations pass under contact brushes. Positive current is sent to the line when a perforation corresponding to the depression of the key passes under the positive brush, and the line discharge maintains the flow at the receiving end until the hole at the other edge of the perforated tape passes under the negative brush and thus establishes a reverse current in the line. The electrolytic action at the receiver (due to the flow of a positive current from a point of suitable material through the special sensitized paper) produces a clear blue color on the yellow tape, but the flow of the reverse current breaks the record. There are no reciprocating parts to the receiving instrument, hence no inertia actions to retard the recording operation. The records produced at extremely high speeds are wonderfully distinct.

A. J. Wurts, who was commissioned by George Westinghouse, Jr., to develop a commercial form of the Nernst electric lamp, has recently given some interesting particulars as to this new form of electric light. The illumination is due to the incandescence of what are called the "glowers." These glowers are made of certain of the rare earths and suitable binding materials. They are in the form of small rods, about 1 inch long and 1-40 inch in diameter, one or more parallel glowers being used according to the candle-power desired. A lamp rated at 50 candle-power has one glower; the 400 candle-power lamp has six glowers, &c. The glowers are nonconductors when cold, hence they must be heated by external means when the lamp is to be lighted. Small electric heaters are placed near the glowers to heat the latter when the current is turned on, automatic "cut outs" throwing the heaters off when the temperature of the glowers has become sufficiently high to conduct the required current. This temperature is about

950 degrees C., or 1600 degrees F., and it requires about 30 seconds to attain it. Other ingenious features are included in the construction of the "ballast," a steady resistance which is necessitated by the peculiar properties of the glowers. The average life of the glowers is about 800 hours with alternating current. When one or more of the glowers has become exhausted the nest of glowers may be removed and a new set put in place without removal of the lamp from its usual position. The old glowers may be replaced and the set can be used for future renewals. The life of the electric heater is about 200 hours, but as it is only in action for a half minute at a time it will outlast many sets of glowers. There is no combustible material in the lamp, porcelain being largely used in its construction. The Nernst lamp gives an extremely steady light of a very desirable character. Colors are seen in their true shades, the light being much superior to the incandescent light in this respect. It is claimed that the energy required for the Nernst lamp is only about one-half that of an incandescent electric light for the same illumination, and it is estimated that the renewals will cost less than for arc lamps.

According to the report in *London Engineering*, R. S. Hutton of Owens College has succeeded in fusing quartz in the electric furnace, thus making apparatus which will withstand much higher temperatures than glass. It is stated that the fused quartz has a very low temperature coefficient, and that when hot it can be quenched in cold water without cracking. This seems to be a very promising material for high temperature apparatus. As yet the material has not been produced entirely free from bubbles.

The power plant of the Canadian Niagara Power Company will consist of 10,000 horse-power units, generating 18,000 volts directly at the dynamos. This is the highest voltage ever delivered by electric generators in commercial operation.

The liquefaction of hydrogen presents a peculiar difficulty not experienced in the production of liquid air. Air is cooled by free expansion, hence if a mass of air is compressed, cooled and then allowed to suddenly expand its temperature is further reduced, and this reduction of temperature is sufficient (under suitable conditions) to liquefy a portion of the air. Hydrogen, however, if expanded freely from normal temperature, undergoes an increase rather than a decrease of temperature. This increase of temperature of hydrogen with free expansion becomes less as the initial temperature is lowered and it is zero at 80.5 degrees C. With an initial temperature of compressed hydrogen lower than 80.5 degrees C. hydrogen is cooled by free expansion, as air is cooled from higher temperatures. Hence, to liquefy hydrogen, liquid air is used to cool the compressed hydrogen below this temperature, when free expansion liquefies a portion of the hydrogen. It is of interest to note that computations made in advance of the experimental determination placed this temperature at 79.3 degrees C., or within 1.2 degrees of the observed result.

### Serious Charge Against a Steel Car Builder.

At Pittsburgh last week the Pressed Steel Car Company filed a bill in equity against John M. Hansen, president of the Standard Steel Car Company, recently organized in Pittsburgh to build a large plant at Butler, Pa., for the manufacture of steel cars. A preliminary injunction is asked against Mr. Hansen, requiring him to deliver up certain blue prints, die drawings and bills of materials, 1100 of which are specified in two schedules appended to the bill, and to which a value of more than \$1,000,000 is affixed.

The bill sets forth that Mr. Hansen, for several years prior to 1899, was chief engineer of the Schoen Pressed Steel Company, taking a similar position with the Pressed Steel Car Company when they took over the Schoen Company. On October 1, 1900, it is added, the duties of assistant to the president were added to those he had before.

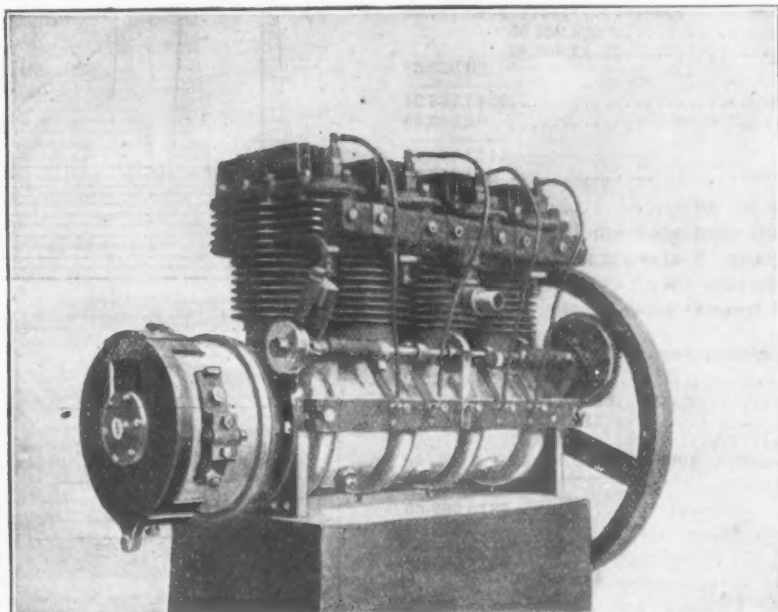


The bill, after detailing the organization of the Standard Steel Car Company, of which Mr. Hansen, H. J. Gearhart, formerly auditor and acting general manager, and Peter F. McCool, formerly superintendent of the McKees Rocks plant of the Pressed Steel Car Company, are the incorporators, proceeds to charge Mr. Hansen with having caused the employees of the Pressed Steel Car Company to make a complete set of the blue prints, die drawings and bills of material of the company, which he carried away with him for the use of the Standard Steel Car Company.

### The Franklin Four-Cylinder Gasoline Engine.

The four-cylinder automobile gasoline engine built by the Franklin Mfg. Company of Syracuse, N. Y., is of the four-cycle, air-cooled type. The four-cylinder pattern has been adopted as it permits of close balancing of the parts, and as the impulses are less violent and more frequent than in motors having fewer cylinders. From this it follows that a much lighter transmission gear may be employed in the multiple cylinder machine. The cylinders are air cooled, as plainly shown in the en-

land, before sailing for England last week, made the following statement in regard to the progress made on the plant: "The pattern and carpenter shops, employing some 300 men, are already in operation, and by July the entire plant will be in full swing. We will not, however, be in a position for some little time to turn out the heavy engines, &c., at present built at the Westinghouse plants at East Pittsburgh, but inside of 12 months we shall be able to manufacture the largest pieces of machinery from our own castings, so that we will then be entirely independent of the Pittsburgh shops. It has been our especial aim to secure for responsible positions in the Manchester works English engineers, 'Americanized,' or I might say 'Pittsburghized,' and with this in view 35 young Britishers, mostly collegians and who have served a five years' apprenticeship in first class English shops, have gone through the various departments of the Westinghouse shops at East Pittsburgh, so as to gain experience in the manufacture of modern electrical machinery. These men have just returned to England to take up important duties at our works. Twenty-five American experts have also been engaged to take charge of departments in the British



THE FRANKLIN FOUR-CYLINDER GASOLINE AUTOMOBILE ENGINE.

graving. The cooling surface, consisting of wings cast on the cylinders, amounts to 21 square feet. The faster the vehicle moves the greater the current of air striking the engine, so that at high speed it does not get any hotter than at slow speed. With the vehicle moving slowly the engine is, of course, running slower, and therefore not giving off as much heat.

The bore of the engine is  $3\frac{1}{4}$  inches, the stroke being the same. This size generates 7 horse-power at 1000 revolutions. The lubrication is by forced feed into the base, where the oil reaches the working parts by the "splash" system. The cam shaft is in the base. The control of the engine is by throttle and automatic spark governor. The gasoline is supplied through a float feed carbureter, having a special compensating attachment for maintaining a constant mixture through the great ranges of speed. This attachment admits of operating the engine at much greater ranges than is ordinarily possible.

The engraving is a rear view, and shows the electric wiring, insulation and spark shaft. The transmission gear, which is shown at the left, is bolted to the frame. This feature renders the construction self contained and insures the proper alignment of the parts. There is a spark plug in the head of each cylinder, and a special coil having a rapid vibrator is employed.

**British Westinghouse Electric Company.**—H. S. Loud, general manager of the new works of the British Westinghouse Electric Company at Manchester, Eng-

land, one of them being T. Smith, formerly foreman of the street railway equipment works, Pittsburgh."

### The Fox Machine Company Reorganized.

The reorganization of the Fox Machine Company of Grand Rapids, Mich., has resulted in the formation of the Fox Typewriter Company, Limited, articles of incorporation for which were filed in Grand Rapids on April 30. The authorized capital of the new company is \$1,000,000, divided into \$400,000 preferred and \$600,000 common stock. Of the preferred stock \$250,000 is to remain in the treasury, held in reserve and utilized as the business develops. The remainder of the preferred stock, \$150,000, is to be sold at once; in fact, a large portion has already been subscribed for by Grand Rapids business men. The proceeds of the sale are to be used as working capital. In consideration of the common stock, the new company take over all the real estate, plants, merchandise, machines, tools, patents and good will of the old company, free from obligation. The board of directors of the new company is as follows: William R. Fox, Clay H. Hollister, James Wylie, Fred. Macey and George Clapperton.

The manufacture and sale of special tools and machinery heretofore carried on by the Fox Machine Company will be continued as a special department of the new company. The manufacture and sale of the Fox typewriter are to be pushed with energy, the intention being to double the output of typewriters immediately.

The foreign as well as domestic sale of typewriters will be continued, the Fox Machine Company having already introduced their typewriter in Europe, Asia, South America and Australia.

### Lake Steamship Earnings.

Recently there were admitted to the list at the New York Stock Exchange \$5,452,000 first mortgage, 5 per cent., gold bonds of 1920 of the American Steamship Company of West Virginia, owned by the American Steel & Wire Company. This stock was transferred on June 4, 1901, to the Pittsburgh Steamship Company, now owned by the United States Steel Corporation. Accompanying the application for listing of the bonds is the following statement of the earnings of the American Steamship Company during the years 1899 and 1900, which is of great interest because reports of this character have rarely found their way into print:

#### Earnings and Expenses During the Year 1899.

Steamer earnings.....	\$696,151.76
Operating expense.....	\$258,996.62
Hull insurance.....	42,676.29
Repairs .....	9,184.23
	<hr/> 310,857.14
Net earnings.....	\$385,294.62
Less: Expenses, &c.....	\$26,922.55
Bond interest.....	12,605.83
	<hr/> 39,528.38
Net profit for 1899.....	\$345,766.24
Surplus from Zenith Transit Company.....	66,569.15
	<hr/> \$412,335.39
Less dividends paid in 1899.....	349,000.00
	<hr/> \$63,335.39

Surplus December 31, 1899.....

The above represents earnings from July 1 on the five Zenith Transit Company boats—viz.: "Queen City," "Crescent City," "Empire City," "Zenith City" and "Superior City," and from October on the "W. H. Gilbert."

#### Earnings and Expenses During the Year 1900.

Steamer earnings.....	\$1,550,987.90
Operating expense.....	\$614,429.45
Hull insurance.....	117,892.67
Repairs .....	5,000.67
Loss on insurance disasters, 1900....	2,702.42
	<hr/> 740,025.21
Net earnings.....	\$810,962.69
Sundry credits, insurance, &c.....	8,022.94
	<hr/> \$818,985.62
Less: Expense, &c.....	\$31,197.89
Bond interest and premiums.....	26,021.69
	<hr/> 57,219.58
Net profit for 1900.....	\$761,766.05
Surplus December 31, 1899.....	63,335.39
	<hr/> \$825,101.44
Less dividends paid in 1900.....	600,000.00
	<hr/> \$225,101.44

Surplus December 31, 1900.....

The above represents earnings of steamers as follows: "Zenith City," 3429 tons; "Queen City," 3198 tons; "Empire City," 3269 tons; "Superior City," 3694 tons; "Crescent City," 3676 tons; "W. H. Gilbert," 2200 tons, for whole season. "J. W. Gates," 4440 tons, from May to end of season; "I. L. Ellwood," 4432 tons, from June to end of season; "Wm. Edenborn," 4432 tons, from July to end of season; "J. J. Hill," 4578 tons, from May to end of season; "A. B. Wolvin," 1587 tons, from August to end of season; "W. P. Palmer," 1609 tons, from July to end of season.

The Vulcan Detinning Company, organized by a syndicate formed by the banking firm of G. Sidenberg & Kraus, 20 Broad street, New York City, and recently incorporated with a capital stock of \$3,500,000, divided into \$1,500,000 preferred and \$2,000,000 common stock, have purchased all the property, patents, processes, &c., of the Vulcan Metal Refining Company of Seward, N. J., and of the Vulcan Western Company of Streator, Ill. Both plants will be operated for the production of tin and steel plate, obtained from tin plate scrap by the electrolytical process. The company have disposed of their entire output of both metals for the year 1902. The officers are Joseph B. Bloomingdale, president; Stephen A. Glina, vice-president; Meyer Hecht, secretary and treasurer, and Adolph Kern, general manager.

## Cable Making on the New East River Bridge.

[With Supplement.]

One of the most interesting features of the work connected with the building of the new East River Bridge, uniting New York and Brooklyn, is that of cable making. That it is also a task of no small magnitude is shown by the statement that the four cables completed will weigh some 5000 tons. Each cable will be composed of 7696 wires of No. 6 gauge and having a strength of 200,000 pounds per sectional square inch. Each of these wires must be carried from anchorage to anchorage over each tower and secured to the eye bars leading into the anchorages. That an idea may be formed of how much greater this task is than any ever before attempted of a similar character, it is only necessary to

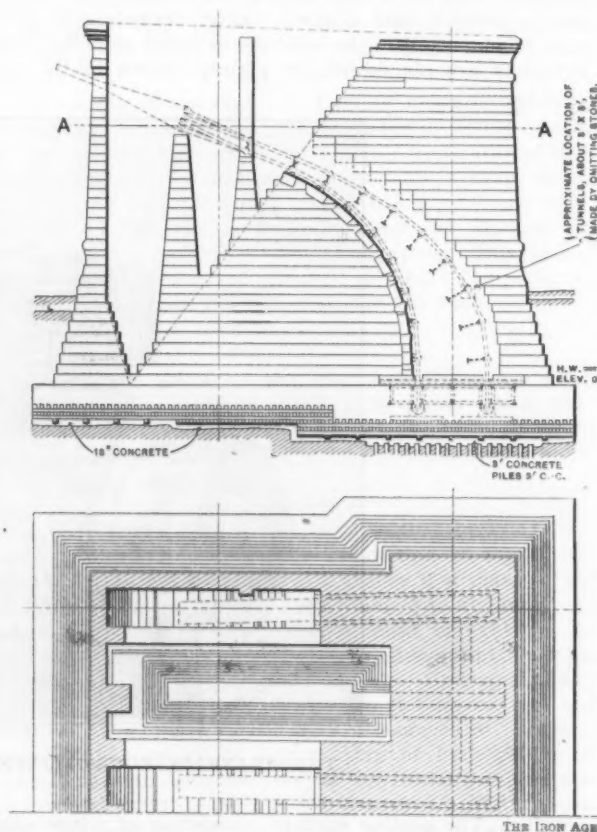


Fig. 9.—Section and Plan of Anchorage.

### CABLE MAKING ON THE NEW EAST RIVER BRIDGE.

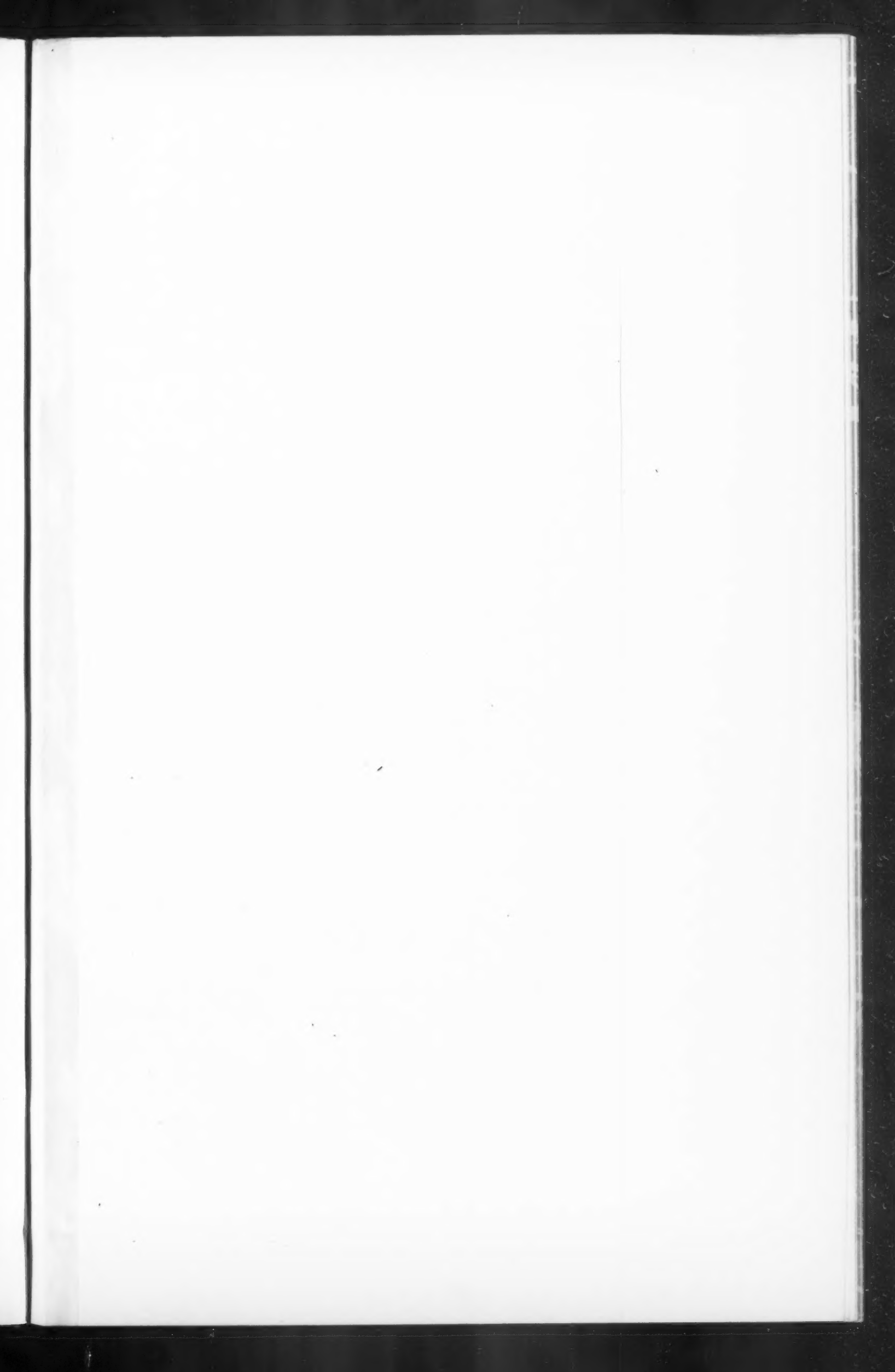
mention the dimensions of the cables of the present Brooklyn suspension bridge. Each of those cables contained 5296 wires of Nos. 7 and 8 gauge, or a total of 21,184 wires, as against 30,784. In the old bridge the four cables weighed 3588 tons.

In the new bridge several innovations have been made both in the design and method of erection, all tending to expedite the work and increase the efficiency of the finished structure. In the present article an attempt will be made only to describe the process of cable making, the changes which have been introduced and the system of anchoring the cables. It will only be necessary to describe the

#### Brooklyn Anchorage.

As our readers are well aware, this is simply a mass of masonry, which, by its dead weight or gravity, resists the pull of the cables and the live and dead loads they are required to carry. The anchorage is supported upon piling, cut off below high water mark and covered with a course of concrete. On the concrete are laid four courses of timber, placed at right angles with each other





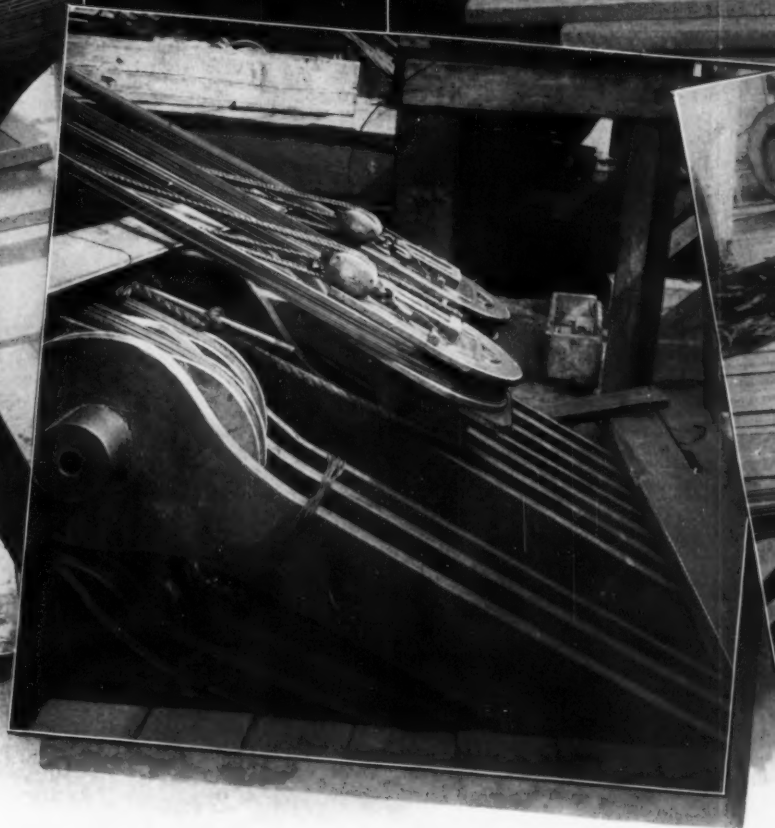
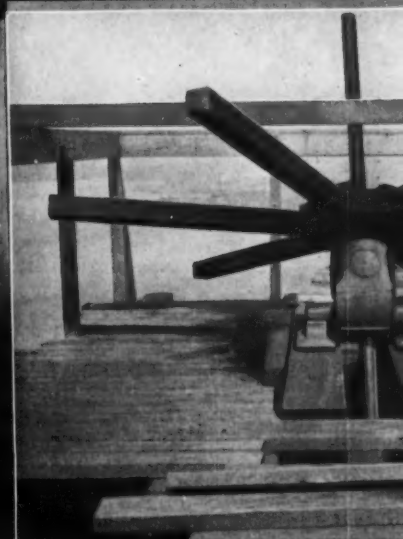
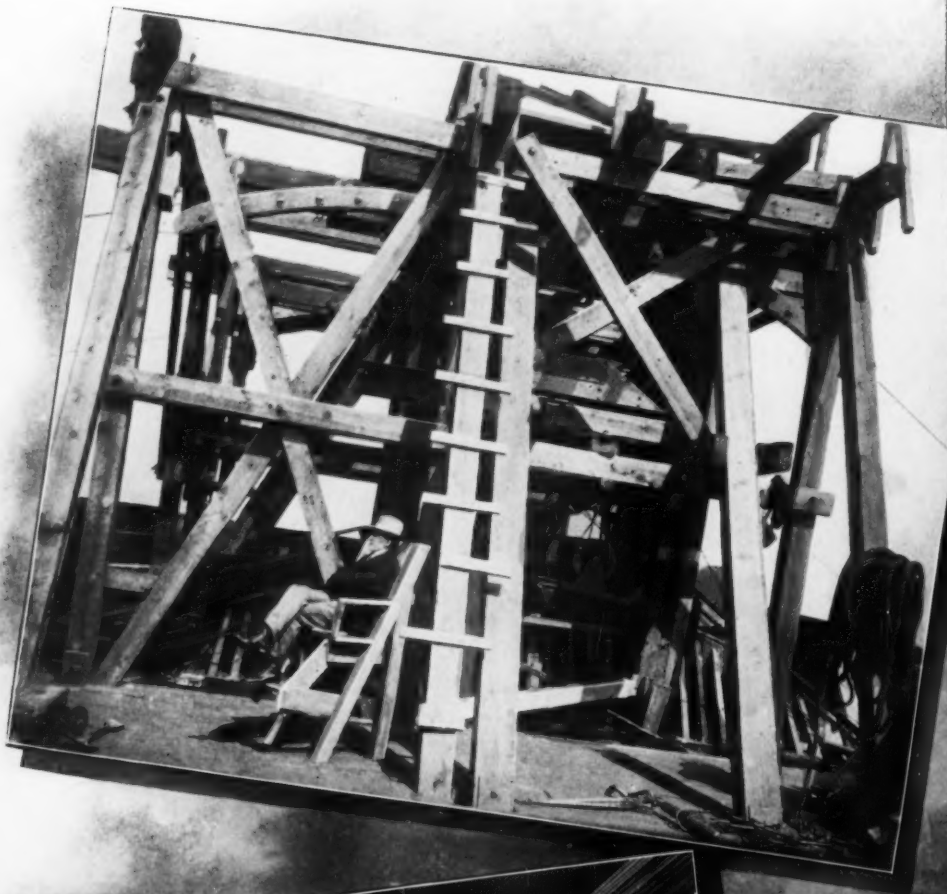


FIG. 1. SIDE VIEW OF SADDLE TOP OF BROOKLYN TOWER.  
FIG. 2. CABLES ENTERING BROOKLYN ANCHORAGE.

FIG. 3. CABLE WIRE  
FIG. 4. CAPSTAN FOR LIFTING  
FIG. 5. CABLE JOINING EYE BARS.

## CABLE MAKING ON THE NEW





BLE WIRE CARRIER.  
OR LIFTING CABLE STRANDS.

FIG. 6. CABLES AND EYE BARS, BROOKLYN ANCHORAGE.

FIG. 7. VIEW FROM BROOKLYN ANCHORAGE.

FIG. 8. SADDLE ON BROOKLYN TOWER.

## NEW EAST RIVER BRIDGE.

THE IRON AGE





and drift bolted to timbers bedded at intervals in the concrete. On this platform is a bed of concrete to receive the masonry and the system of girders to which the cables are connected and which serve to distribute the strain. At the base the anchorage measures 158 feet parallel with the bridge and 177 feet at right angles. On top the dimensions are 127 x 149 feet. The total stone masonry in the mass is 44,597 cubic yards.

All the steel—angles and plates, eye bars, pins, rolled beams, &c.—is open hearth acid. The eye bars, when tested in full size bars, were required to have an ultimate strength of at least 60,000 pounds per square inch, an elastic limit of at least 35,000 pounds per square inch, and an elongation of at least 15 per cent. of the original length of the parallel portion of the bar for bars from 9 to 12 feet in length.

The anchor platform consists of a system of girders to which the chains—formed of eye bars—extending to the cables proper are secured. The platforms for the outer cables cover a space 36 x 24 feet, those for the

carried by a frame composed of three bars. At the upper end of each bar is a bracket projecting at right angles, and which is secured to the operating cable. The side projection of these brackets permits the carrier to pass over the guide pulleys and over the segment track at the top of the tower, Fig. 1.

The operating cable extends from one anchorage to the other, and is actuated by an engine on the New York side. At the Brooklyn end this cable passes around horizontally disposed sheaves, which can be adjusted toward or from each other so as to bring the cable to the proper elevation over the main cable which it is assembling. Two strands are built simultaneously, one operating cable having two carriers, one serving one strand and one the other. One carrier brings the wire from the New York side, while the other takes it from the Brooklyn.

The first six wires entering a new strand are carefully adjusted for height by comparing them with a guide wire. After this has been done the guide wire is no

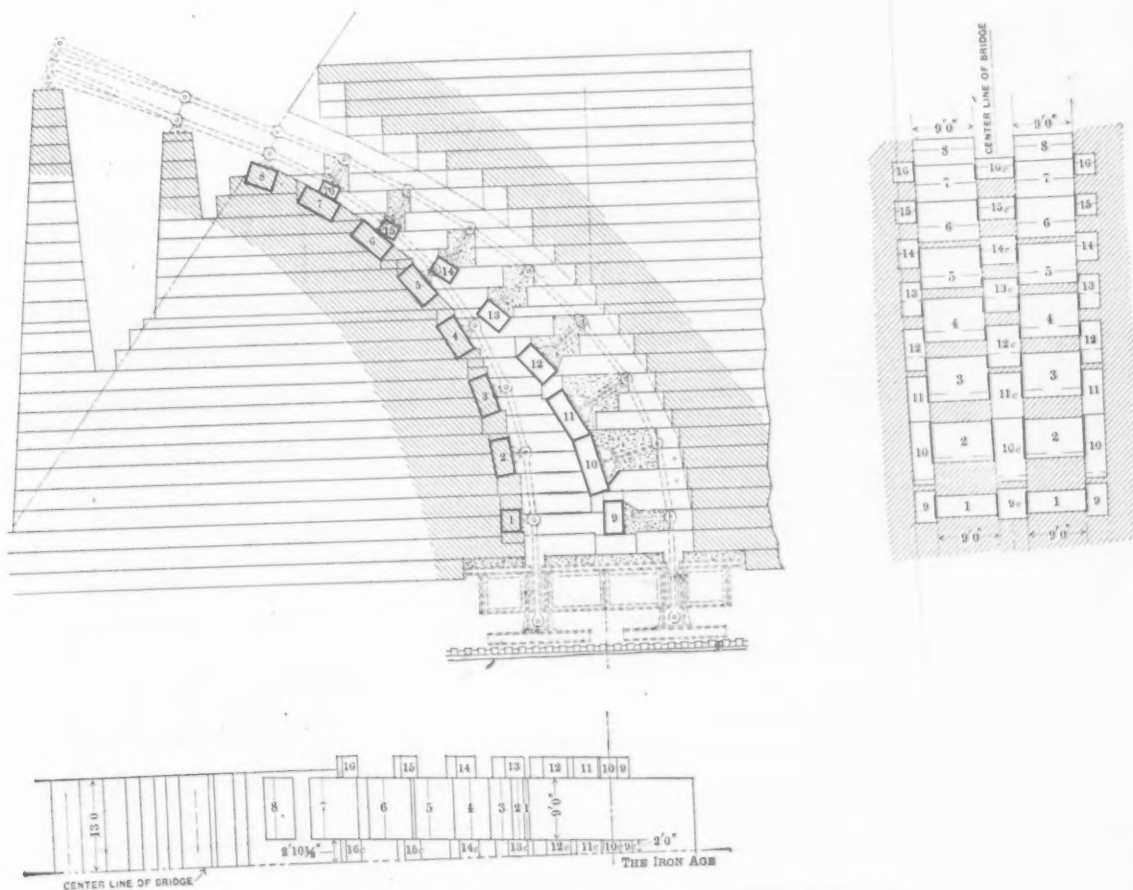


Fig. 10.—Section of Anchorage, Showing Chain Knuckle Supports.

#### CABLE MAKING ON THE NEW EAST RIVER BRIDGE.

inner cables being 49 x 36 feet. Upon these platforms, as stated above, the masonry is erected. These platforms are shown in Fig. 12.

##### Anchor Chains.

The drawings show the arrangement of the anchor chains. These consist of eye bars arranged in two groups, one over the other. The position of the chains is made plain by Fig. 11. These bars vary in length from 9 feet 11 1/2 inches to 14 1/2 feet, and in section from 9 x 1 1/2 inches to 9 x 2 inches. In all there are 1516 bars.

Upon entering the anchorage the two groups of chains curve downward and away from each other. The radius of the lower chain is 58 1/2 feet, and the distance apart at the lower ends is 20 feet. Each chain joint is supported upon knuckle plates, as shown in Fig. 10.

##### Cable Making.

The engravings upon the accompanying plate show some of the operations connected with cable making. The wire carrier, Fig. 3, consists of a grooved pulley

longer used until needed for a new strand, the six wires serving as a guide for all the others of that particular strand. Stationed at intervals on both of the shore spans and the main span are men who signal the position of the wire and whether it should be raised or lowered. This adjusting is done by means of a block and tackle at the anchorage.

On top of each tower, just over the saddle, are two groups of sheaves, as shown in Fig. 8. When all the wires of a strand, 208 in number, have been placed they are brought together to form a round bundle and lashed at intervals with wire. The strand is then lifted by the capstan, Fig. 4, which is located on top of a frame directly over the sheaves just mentioned, and lowered into place on the saddle.

At each anchorage the wire passes around a cast steel shoe, Fig. 5, which is held to the upper links of the cable chain. While the shoe is receiving the wire it rests in a horizontal position. After it has received all the wires of a strand it must be turned one-quarter, or

so as to stand in a vertical position. Before this can be accomplished it is necessary to relieve the eye bars, or chain, of the strain of the strand. To do this the yoke holding the shoe is attached to a heavy cable made fast in the anchorage. Between the cable and yoke is inserted a massive turnbuckle, the nut of which is provided with a long ratchet lever which is operated by the hoisting engine. When the cable bears all the load the shoe is turned to the position indicated in Fig. 6, the hoisting engine being again called upon to perform this duty. The yoke is then passed over the eye bar pin, when the holding cable is released.

The wires are drawn in lengths of 4000 feet and over. The splices are, therefore, few and far between. The shop splice is a rolled thread, right and left, the union being a thimble similarly threaded. The splice made in the field is a cut thread.

The yoke shown in Fig. 2 is situated at the edge of the anchorage. Its only office is to group the strands and so arrange them that the completed cable will be cir-

### The Bronze Yacht "Weetamoe."

From a recent issue of the *Providence Journal* the following description of the bronze yacht "Weetamoe," now being built for H. F. Lippitt of Providence, R. I., by George Lawley & Sons, South Boston, Mass., is taken: The yacht is a 60-rating sloop, designed by Gardner & Cox of New York, is as powerful according to size as the more recent cup defenders, and is attracting much attention for the fine mechanical skill developed in plating the hull.

The boat is plated throughout with Tobin bronze, of which the Ansonia Brass & Copper Company, Ansonia, Conn., are the sole manufacturers. A new feature is the fastening of 22 frames of that metal in the midship section for the purpose of overcoming galvanic action, which, as is well known in yacht construction, is deteriorating in effect immediately where the greatest dampness collects—in the wake of the lead keel. All the other body frames, together with the deck frames, are of

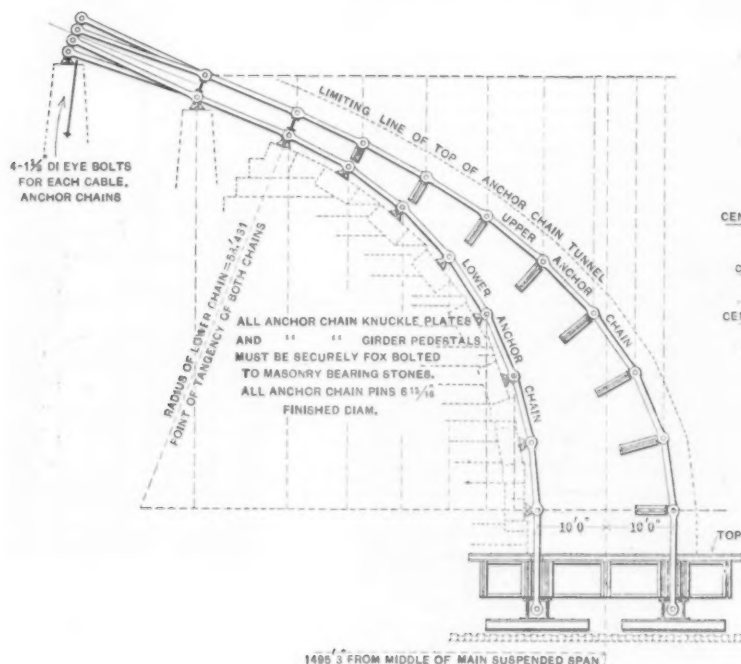


Fig. 11.—Side Elevation Anchor Chain.

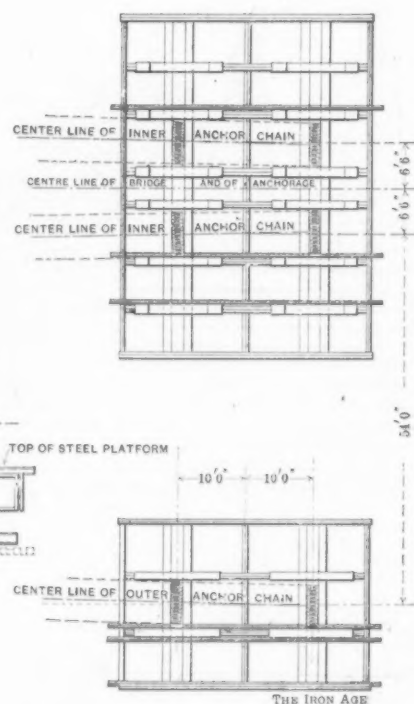


Fig. 12.—Anchorage Girders.

### CABLE MAKING ON THE NEW EAST RIVER BRIDGE.

cular. When the main span of the bridge has been finished the increased load will raise the cables at this point so as to permit of the removal of the yokes. The cables are being constructed by the John A. Roebling's Sons Company.

The fire loss of the United States and Canada for the month of April, according to the reports of the *New York Journal of Commerce*, amounted to \$13,894,000, as compared with \$12,056,000 in the preceding month, and \$11,352,000 in April, 1901. The total loss for the first four months of the present year is \$61,994,000, being \$5,000,000 increase over the figures for the corresponding period of last year and \$4,500,000 less than the first four months of 1900.

Frank S. Barnett, of the firm of L. B. Smyser & Co., mechanical and consulting engineers of 136 Liberty street, New York, has accepted the position of general manager of the McFarland Foundry & Machine Works of Trenton, N. J., manufacturers of wire drawing machinery, motors for automobiles and marine purposes, &c.

nickel steel. The deck stringers, a foot wide on each side and  $1\frac{1}{8}$  inches in thickness; the floor plates over the lead diagonal braces, rudder and end castings are of Tobin bronze. The lead keel, weighing 22 tons, is fashioned much after the plan of the more recent cup defenders. It is 14 feet long on the top and 11 feet on the bottom.

The frames are spaced  $15\frac{1}{4}$  inches apart, and are webbed and bulbed  $2\frac{1}{8} \times 1\frac{1}{8}$  inches, excepting in the wake of the mainmast and chain plates. In the mast wake are two nickel steel 5-inch web frames, continuing in an unbroken line around the interior of the boat, forming deck beams, body frames and floor plates. These web frames are in the form of a Z bar. There is one of these Z bars in the wake of the chain plates, where part of the greatest tension develops in a race. Other frames in that location are 3-inch bulbed angle bars.

Including the garboard and sheer plates, there are five strakes of plating, with a length of six plates on the sheer strake. These plates, though yet in the fastening process, show a high polish, and are devoid to a great extent of mar or dent. The plates have an average

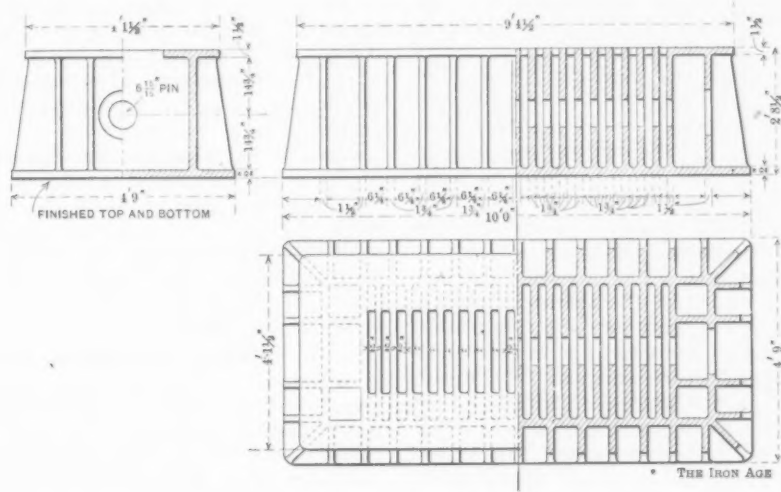


width of 42 inches. The heaviest plating, naturally, is at the lowest point—the garboard. Here the weight of the Tobin bronze plates is 6 pounds to the square foot, while on the sheer strake the weight is 5 pounds to the square foot, or about  $\frac{1}{8}$  inch in thickness, excepting in the immediate overhangs, where the weight of bronze plate tips the scales at  $4\frac{1}{2}$  pounds to the square foot.

That the most skilled mechanics are employed in fastening the plates is noted by the fine riveting. The plates at the laps are double riveted by the so-called

cause the least deterioration to the hull plates, and so also in regard to the use of steel rivets.

In the overhangs the connecting plates at the base of the frames are of nickel steel, forming a steel foundation for the plating at each end, while in every way possible bronze was introduced in the midship section, a plan that merits much favorable comment, because the foundation is thus laid against the least degree of corrosion. When completely fastened the plating, now very bright and smooth, will be highly polished.



the Thames Court Company, a corporation with a capital of \$1,000,000, who have recently acquired the Boreel Building property on Broadway, New York. About a year ago it was sold by the Boreel heirs at \$2,050,000.

## Notes from Great Britain.

### Is It Protection?

LONDON, April 19, 1902.—In *The Iron Age* of April 3 I devoted three columns to indicate my belief that Great Britain is heading for protection. The proposals of the Chancellor of the Exchequer, particulars of which have doubtless been cabled over to America, show clearly enough that my prognostications were not far removed from actual fact. I must confess, however, that I little anticipated so speedy a realization of my prophecy. The question now is, How far are the budget proposals in the nature of a protective tariff? The point is being argued with considerable vehemence over here. In a certain direct sense, it would be untrue to say that the small duty levied upon imported grain is "protective," if by protection is meant such a duty as will close out foreign products to the benefit of the home commodity. It is not argued, even by the most extreme free trader, that the duty of 5 pence per hundredweight on flour and 3 pence per hundredweight on corn and meal will divert present supplies from present sources. The Chancellor of the Exchequer is himself insistent that this is in no sense a protective duty. He avows himself still a free trader. In his belief, the great clearance of the tariff with which the names of Sir Robert Peel and W. E. Gladstone are associated, a clearance of scores and hundreds of articles, many of them producing very little revenue, was a greater relief to the springs of industry in this country, and was a greater advantage in increasing trade and commerce and the chances of employment at good wages, than the removal of any particular tax on any particular article, however necessary that article might be to their comfort. Therefore, he says, in seeking for a new indirect taxation, he desires to find an article or articles practically of universal consumption from which a large revenue would be produced to the Exchequer without any injurious or oppressive burden upon any individual or upon any class. Holding these views, it is not surprising that he has gone back to the old registration duty on corn and flour, which continued long after the inauguration of the free trade era in this country.

It may, I think, be freely admitted that, in the strict sense of the word, the new budget proposals are not "protective." But other considerations must be taken into account. It is to be remembered that a large number of Conservatives sitting in the House of Commons are more or less committed to protection. John Bright always prophesied that if they got a chance, they would undoubtedly reimpose a protective tariff. He pungently remarked that "the dog returns to its vomit." In this sense, then, it is not unfair to assume that the new budget proposals constitute the thin end of the wedge. Another question which has to be answered in this connection is, assuming that a duty be imposed upon imported goods, at what point does it become protective? For example, small though the present duty is, it has considerable effect on the allied industries. From grain and flour and meal are made a hundred and one articles of consumption, and upon these goods the influence of the tariff will be felt. So that we have to remember that, even if the proposed duty does not actually divert the trade of the raw material, yet it may, in the long run, divert the trade of the numerous articles of commerce of which grain of one sort or another is a predominant component part.

### The Economic Effect.

But there is another and more serious aspect of this new departure. I have quoted above the argument used by Lowe, to the effect that the very tax in question in his day took more out of the pockets of the consumer than it gave to the Exchequer, and that it added protection to the home producer at the cost of the consumer. The first objection distinctly holds good in this

case. Unmistakably, this new tax bill will take more out of the pockets of the consumer than the Chancellor of the Exchequer will reap in revenue. He argued, in presenting the budget, that the amount coming to the Exchequer was so small, £2,650,000, it would not affect the consumer. This is the old plea always advanced by Chancellors of the Exchequer when taxing commodities. Strictly speaking, the actual tax, if levied upon the consumer, would only amount to  $\frac{1}{8}$  to 1-16 penny on a 4-pound loaf. As there is no coin in our currency to connote that amount, and as it is perfectly certain that the producers will not pay the tax, it naturally follows that they will raise the price so as to pay not only £2,650,000 for the Exchequer, but will probably make as much again for themselves. This is the more easily done inasmuch as the producers are more or less effectively organized, while the consumer is only one of a disorganized mass. Thus we find that one of the necessities of life is not only to be taxed, but the tax will be paid by those least able to afford the money. This will undoubtedly lead to a slight increase in the cost of living without any commensurate rise in wages. It may, in its turn, lead to innumerable commercial complications. I am not surprised, therefore, to see the *Economist* describing the budget as "vicious and reactionary."

### Some Approaching Contracts.

A number of large contracts are at the present moment awaiting tender. A new bridge over the Neva in St. Petersburg is about to be built, and the contract is thrown open to Russian and foreign engineers. For the best three designs the municipal authorities will award prizes of 12,000, 8000 and 5000 rubles, and other plans may be purchased for 2000 rubles. The municipality stipulate that they may refuse to carry out any of the designs submitted, premiated or otherwise. The cost of construction must not exceed 3,500,000 rubles, and the municipal authorities provide a table specifying the prices paid for labor and material in St. Petersburg. Particular attention is directed to design and ornamentation of the structure, which is to harmonize with the surrounding buildings. The competition closes on September 14 next (O. S. September 1).

In Calcutta they want sand washers, which are to be supplied c.i.f. Calcutta, for the filter station at Pulta, for the corporation of Calcutta. The average quantity of sand dealt with per annum may be taken as 1,400,000 cubic feet, and the plant should be capable of dealing with 700 cubic feet of sand per hour. The tender must include the cost of any driving or pumping plant necessary in connection with the washers, as water under pressure is not available at the station. A plan of the works may be had by any maker of sand washers upon application at the office of the Engineer, and upon this plan the tenderer is requested to suggest the disposition of the sand washing plant. A copy of the drawing of the "Berlin" type washer may also be had upon application, but tenderers are at liberty to suggest any type. Tenders indorsed "Tender for Sand Washers" should be addressed to the vice-chairman of the Calcutta Corporation, and delivered at the Municipal Office, Calcutta, on June 11.

Indian railways are also calling for railway stores. Thus, car material is required by the Bengal & North-western Railway Company. A supply is asked for of mild steel and wrought iron materials for 200 covered freight cars, and 400 pairs of wheels and axles. The Bombay, Baroda & Central India Railway Company also call for the supply of steel material and india rubber fittings.

### Closing of Marked Bar Works.

The old firm of Philip Williams & Sons of the Wednesbury Oak Iron Works, Tipton, are about to close their mills, forges and blast furnaces with a view of confining their operations to the colliery department. The Wednesbury Oak Works were established by the late Philip Williams in the early part of last century, and were considered to be the most complete and best equipped in South Staffordshire. The firm originally had three blast furnaces for the production of cold blast and hot air pig iron of the "all mine" class, but one of the furnaces was dismantled some years ago. The works consisted of 32 puddling furnaces, five mills and forges,



with a producing capacity of 300 tons of bars, strip and sheets per week. The firm were one of the original marked bar houses in South Staffordshire, their name being identified with the brand of iron known as the Wednesbury Oak Miter. Their cable iron has been specified by the Admiralty and home and foreign shipbuilders. Philip Williams & Sons have been from the outset one of the 12 selected firms of the Midland Iron and Steel Wages Board, whose productions form the basis upon which the average price of iron under the sliding scale arrangement is taken. The reasons given by the management for closing the works and probably breaking up the plant are the unprofitable character of the iron trade, alike in the crude and finished departments, coupled with the disadvantage of an inland district like South Staffordshire in competing with firms situated on the coast.

#### American Iron Orders.

During a hurried trip recently to Liverpool I was informed there by an iron merchant that he had been pressed to supply 50,000 tons of pig iron for America. This same order, or another, is being hawked about more than a little. One or two Midland firms have declined, being filled with work. A Northamptonshire firm were in the same predicament, and it is now being offered in the north of England.

#### An Armor Plate Trial.

Another armor plate trial took place last week of heavy armor submitted by Sir W. G. Armstrong, Whitworth & Co. from their Openshaw Works, Manchester. The plate measured 10 x 7 x 9 inches, or what is known as a 360-pound plate, though the actual weight was 350 pounds. The quality was the Openshaw cemented or hard face armor. The standard test for this class of plate consists of firing three rounds from the 9.2 inch gun at a velocity of 1850 to 1900 foot seconds, with 380-pound Holtzer armor piercing shell. The first round was fired at 1909 foot seconds, and the plate was found to offer complete resistance. The projectile was broken up into numerous pieces, the head only being fused into the surface of the plate, the maximum penetration being 2.6 inches. The second round struck with a velocity of 1919 foot seconds, and the projectile was broken up in a similar manner to the first, the penetration being the same as for the first round. The third round followed with 1882 foot seconds. The shot again broke up, with a maximum penetration of 2 inches. At the conclusion of the trial the plate was absolutely free from any cracks, and completely fulfilled the requirements of the Admiralty for admitting armor of this class for use in His Majesty's ships, especially as the plate was on the thin side and the velocities were on the high side. Sir W. G. Armstrong, Whitworth & Co., Limited, are manufacturing armor of this quality for the recently ordered Chilean battle ships now building at Elswick, and this plate represents the quality to be supplied for the new cruisers and battle ships of the King Edward VII class.

#### The Cape to Cairo Railway.

It is now authoritatively stated that the Cape to Cairo Railway has been surveyed as far as Zambesi, where a great steel bridge, having one span of 500 feet, will carry the line across the river at the Victoria Falls. The whole section of the river from Bulawayo to the Zambesi, 275 miles in length, or nearly 1700 miles from Cape Town, is expected to be opened next year. Locomotives for contractors' purposes are now running on it for a short distance north of the present terminus, and a railway exploration party has been dispatched over the railway route beyond Victoria Falls as far as Tanganyika.

#### Russian Pig Iron.

The steamer "Krostrena" has arrived in the Clyde with about 4000 tons of Russian pig iron. One thousand tons of this were discharged at Ardrossan, and the remainder has been brought to Glasgow. The cargo comes from Kertch, and is the first of the kind to arrive in this country.

#### Amalgamated Society of Engineers.

The fifty-first annual report of the Amalgamated Society of Engineers was issued to members this week.

The income for the year was £346,462, as compared with £333,555 in 1900. The expenditure was £260,635, compared with £234,194 in the previous year, the increase being chiefly due to additional unemployed and superannuation benefit. The report announces that the attempt to exclude members from American workshops has been shelved. In regard to this matter it is sarcastically remarked: "Our American comrades have just reached that stage in organization which is sometimes marked by crude attempts to inaugurate the millennium of brotherly love by unlovely methods of coercion and intolerance. We are not unfamiliar with such manifestations on this side of the water, and are able therefore to appraise the attempts of the International Machinists' organization at their true value." In view of the allegations of "Ca' Canny" made against British trade unionists, it is interesting to observe that last year five members of the Amalgamated Society of Engineers were excluded from membership for the offense of "chronic laziness" and three for "general bad conduct."

#### Standardization.

The Glasgow Chamber of Commerce have forwarded the following letter to the Engineering Standards Committee. As coming from so influential a body, it is worthy of permanent record:

"The directors of this chamber have learned with great interest and pleasure of the formation of your committee to provide a remedy, by the standardization of iron and steel products, for a condition of things which adversely affects the trade of the country, and which is becoming of increasingly urgent importance. The directors are in fullest sympathy with the objects which the committee has been formed to accomplish, many of the members of the chamber having practical experience of the evils which it is sought to overcome, and I am desired to express the sympathy of the directors with the work undertaken by the committee, and to say that it will be a pleasure to them if they can in any way contribute to its success.

"WILLIAM JACKS, Vice-President."

#### German Copper Consumption.

With reference to some recent remarks of mine upon the probabilities of increased demand for copper, the following statistics of German copper are given by Aron Hirsch & Sohn of Halberstadt:

	Metric tons. 1901.	Metric tons. 1900.	Metric tons. 1899.
Estimated consumption of copper in Germany .....	89,548	116,900	102,618
Imports from the United States....	42,422	66,264	47,742
German copper production (estimated) 30,335		32,423	37,676

The German consumption for different processes is estimated in the following way:

	Metric tons. 1901.	Metric tons. 1900.
Electrical purposes.....	28,000	43,000
Sheet copper.....	16,000	18,000
Brass and wire.....	30,000	35,000
Chemical purposes.....	2,000	2,000
Shipbuilding, railroad and casting.....	18,000	19,000
Totals.....	90,000	117,000

The marked decline in the use of copper in the electrical trades is significant.

S. G. H.

The dam of the Ellwood City Power Company, at Ellwood City, Pa., is being pushed toward completion rapidly and will be a valuable addition to the manufacturing resources of the western part of Pennsylvania. The company are capitalized at \$100,000 and the stock is principally held by Ellwood City parties, the largest holder being H. W. Hartman. The amount of power which will be developed when the Connoquenessing River is at its normal stage will be 1500 horse-power. This is said to be the first installation for the use of water power to generate electricity in western Pennsylvania. The power will be offered to the several factories at Ellwood City at low rates, and the promoters of the improvement expect important additions to the factory district of the town on account of the cheap power. It will be transmitted to all parts of the town for both light and power purposes.

## Notes on Iron Analysis

BY GEORGE T. DOUGHERTY, CHICAGO.

### Complete Evolution Method for Sulphur in Iron.

It has been a matter of knowledge among many of us since about 10 or 15 years ago, though it has never been promulgated in text books issued to date, that the evolution method frequently fails to give the full amount of sulphur present in samples of pig or cast iron, the deficiency ranging from 0.005 up to 0.025 per cent., which is the maximum that I have obtained in my individual experience. Various unsuccessful attempts have been made to overcome this defect of the method, in order to avoid resorting to the slow and tedious gravimetric oxidation method. Among them has been the use of hot dilute hydrochloric acid instead of cold for starting the decomposition, the treatment of the insoluble residue after evolution for any additional sulphur, and the addition of an arbitrary correction factor of 0.010 to 0.020 to the per cent. obtained by direct titration. This is the custom in many places, a practice which involves a serious element of uncertainty when it comes to the question of accepting or rejecting a car lot of pig metal bought on the specification of not to exceed 0.030 or 0.050 per cent. of sulphur, as the case may be. The insoluble residue rarely yields on examination enough sulphur to account for the shortage. Most of the lost sulphur is supposablely of the organic or metcapan series, which is not absorbable in the alkali solution.

Recently there came to my notice a method proposed by Walters and Miller of annealing iron drillings in a porcelain boat in a porcelain or nickel tube in a current of natural gas or some non-oxidizing gas, previous to solution in the evolution flask. The principle of the method, together with the closely agreeing analyses submitted by the authors in corroboration, appeared attractive to me, but the mode of application required would put it out of the way of many crowded laboratories which may not care to install such a bulky apparatus. My mind chanced to hit on trying a covered porcelain crucible in its stead, and I have found it to work like a charm, no current of any kind of gas being necessary, but only a piece of filter paper loosely laid on top of the drillings in order to maintain a reducing atmosphere during the operation of igniting for 15 minutes. I first tried wrapping the drillings in filter paper and found it would require at least one-half hour's ignition to get out the maximum results. If, however, the drillings are placed direct in the porcelain crucible and one-half of a 9 c. cm. filter paper is laid loosely on top of the mass 15 minutes' strong ignition is sufficient. The "adjustable" type of Bunsen burner sold for gasoline gas will give the requisite strong temperature with coal gas. Heavily graphitic drillings barely need the presence of paper to prevent oxidation, but it is a safe policy to use it on all kinds of iron samples. After the ignition the drillings will be found to have slightly set or caked together, but are easily disintegrated and transferred without loss into the evolution flask. I use 50 c. cm. of 1 to 1 hydrochloric acid on 5 grams of drillings and absorb the  $H_2S$  evolved in 17 c. cm. of caustic potash solution (350 grams of Merck's purified stick potash in 2 liters) in a Will and Varrentrapp nitrogen bulb, which is admirably adapted to prevent back suction as well as to insure a double bubbling of the gas. This amount of potash solution, after diluting to the usual volume of 400 c. cm. in a No. 4 Griffin beaker, and acidifying with 20 c. cm. strong hydrochloric acid, usually takes up 0.1 to 0.35 c. cm. of standard iodine solution in a blank test, and of course this must always be deducted. Standardize the iodine solution with a standard steel, whose sulphur contents have been determined by two or more gravimetric oxidation analyses, preferably of over 0.050 per cent. sulphur. The iodine solution is made up by dissolving 17.715 grams of pure iodine in a 50 c. cm. solution of 30 grams of potassium iodide in a beaker, and after all is dissolved by shaking, dilute to 5 liters; each c. cm. of it will be found to equal 0.0005 grams sulphur, or 0.010 per cent. sulphur when calculated on 5 grams of steel run through as above. Verify each fresh iodine solution, or whenever in doubt, by running the standard steel

through under similar conditions as for regular work. In gravimetric oxidation work on standard or special samples, the addition of 20 c. cm. bromine water to 60 or 80 c. cm. of the usual aqua regia will effect the complete oxidation of all the sulphur present, which is not usually possible with the simple aqua regia; only one evaporation is necessary.

Below I give a memorandum of my various experiments in this complete evolution method. The three standard cast irons, B, C and D, were furnished by the Standardizing Bureau of American Foundrymen's Association, with its official analyses of same. The two Lebanon pigs are coppery, 0.8 to 1.25 per cent. copper; the gravimetric sulphur percentages given of each were determined by myself.

#### Standard Iron B.

Official analysis..	{ 0.038 per cent. sulphur by evolution method.	
	{ 0.056 per cent. sulphur by oxidation method.	
		Evolution method.
		Per cent.
Not Ignited previously.....		0.041
Wrapped in filter paper and Ignited 30 minutes.....		{ 0.059
		{ 0.053
Wrapped in filter paper and Ignited 15 minutes.....		{ 0.049
		{ 0.052
Ignited 15 minutes without any paper at all.....		{ 0.055
		{ 0.057
Ignited 15 minutes, paper on top of drillings.....		{ 0.058
		{ 0.057

#### Standard Iron C.

Official analysis..	{ 0.059 per cent. sulphur by evolution method.	
	{ 0.076 per cent. sulphur by oxidation method.	
		Evolution method.
		Per cent.
Not Ignited previously.....		0.060
Wrapped in filter paper and Ignited 30 minutes.....		{ 0.076
		{ 0.076
Ignited 15 minutes, paper on top of drillings.....		{ 0.079
		{ 0.076

#### Standard Iron D.

Official analysis..	{ 0.024 per cent. by evolution method.	
	{ 0.031 per cent. by oxidation method.	
		Evolution method.
		Per cent.
Not Ignited previously.....		0.022
Ignited 15 minutes, paper above drillings.....		{ 0.031
		{ 0.030

#### Lebanon Pig, 1.

Oxidation method.....	0.046
Evolution without previous ignition.....	0.020
Evolution after one-half hour's ignition.....	0.043

#### Lebanon Pig, 2.

Oxidation method.....	0.032
Evolution without previous ignition.....	0.010
Evolution after one-half hour's ignition.....	0.030

#### Stewart Pig.

Oxidation method.....	0.011
Evolution without previous ignition.....	0.003
Evolution after 15 minutes' ignition.....	0.009

There always appears an uneven mass of "scum" on the surface of the liquid when iron drillings not previously ignited have been dissolved in the evolution flask. But when the drillings treated had been ignited before the solution would have a smooth surface and be as free of scum as that of steels. In the case of the three cast iron standards, B, C and D, the solution after ignition of the drillings takes place very quickly and almost instantaneously; but the Lebanon pigs after ignition require a rather longer time for complete solution than when not previously ignited. I use 20 c. cm. water + 35 c. cm. strong HCl on Lebanon pigs on account of their peculiar or coppery nature, when ordinary irons require only 25 c. cm. water + 25 c. cm. strong HCl.

#### Determination of Graphite by Direct Weight.

One gram of drillings is treated with 60 c. cm. of nitric acid, 1.13 specific gravity, in a No. 2 Griffin beaker; gentle heat is applied for about 30 minutes, or until no more nitrons fumes come off; then boil hard for about five minutes. Weigh previously a Gooch crucible and a disk of Swedish No. 0 filtering paper cut to about the size of the bottom of the Gooch crucible, and just previously dried for one hour at 115 degrees C., weighing the disk after three or five minutes in the desiccator, for it is sometimes aggravatingly hygroscopic. Stir the liquid just before filtering it into the paper disk fitted in the Gooch crucible under suction. Wash in this order: Once with diluted nitric acid, thrice with hot water, twice with hot 10 to 15 per cent. KHO solution, thrice



with hot water, twice with hot dilute hydrochloric acid, thrice with hot water, once with alcohol and once with ether or 87 degrees test gasoline.

Dry the Gooch crucible and contents for one hour at 115 to 120 degrees C, and weigh after five minutes in the desiccator (1), open the crucible and ignite until nothing black remains and weigh again (2).

1. Increase of weight over combined tares of Gooch crucible and paper disk equals graphitic matter plus silica, &c.
2. Increase of weight over tare of crucible equals silica or mineral matter.
- 1 — 2 equals graphitic matter. Graphitic matter multiplied by 0.96 equals amount of true graphite.

The object of stirring the liquid just before filtering is to prevent occasional clogging of the filter by the gelatinized silica. This, together with the washing with KHO, removes all the necessity for introducing any hydrofluoric acid, as is used by several chemists. Hydrofluoric acid does not decompose or remove any carbide insoluble in simple dilute nitric acid, as KHO does. Hydrofluoric acid, whenever used, usually causes irregular final results. It will be necessary to wash the graphitic residue with KHO, not only to remove silica, but also to decompose the small quantity of insoluble carbide, which will be shown by the deep brown liquid running out of the filter on application of KHO. When the silica is all but eliminated in this manner graphite will be vastly easier and quicker to burn up. I do not recommend asbestos for filtering and burning graphite on for direct weighing, for two reasons:

1. The burning of graphite on an asbestos filter, since it is out of contact with the red hot metal of the crucible, is a very difficult and tedious operation in any crucible.

2. Asbestos, even when previously purified by acids and ignited, is, contrary to general expectations, slightly but appreciably volatile at the temperature of the blast lamp or "adjustable" Bunsen, which temperature is necessary to burn up graphite. I have determined this fact by many experiments on different lots of asbestos.

The use of a Gooch crucible with a paper disk for filtering and weighing graphite and washing, as above recommended, and applying the factor for 0.96 are points of the method which will largely remedy objections heretofore urged against the method of direct weight for graphite. This method professes to give commercially accurate results, though not quite equal in scientific accuracy to the regular combustion process most carefully performed.

#### Continual Diminution of Graphite in Much Used Drillings.

Dr. P. W. Shiuer, in "Transactions of American Institute of Mining Engineers," Volume XLV, recommends that for determining graphite in cast iron the drillings be made wet with alcohol to mix and weigh out for analysis to prevent segregations and irregularities in results. I have since found out a startling fact—that if alcohol be not used in mixing the drillings the per cent. of graphite (and total carbon also) will be constantly lowered little by little whenever the drillings are poured out of the container, mixed over and weighed out for any determination of that or other elements. Also, a serious loss in graphite will be suffered if drillings of cast or pig iron are powdered and sifted, as is done by many chemists, though with the laudable intention of securing a thoroughly homogeneous sample.

To illustrate the extent of loss in graphite contents in dry samples of iron drillings I submit here below the official analyses of standardized iron drillings A and D supplied by the Standardizing Bureau of American Foundrymen's Association when freshly prepared and my own determinations (by combustion) after the contents of the bottles containing those two samples have been three-fourths or four-fifths used up:

	Graphite when new. Per cent.	Graphite after three-fourths has been used up. Per cent.
A.....	3.11	2.12
D.....	2.80	2.16

It is up to the Standardizing Bureau of the American Foundrymen's Association to supply its carbon stand-

ards only after mixing with alcohol and fill the bottles with alcohol-moist drillings.

The probable reason for the constant loss of graphite in dry samples when much used is the low gravity of the graphite, as compared with the rest of the iron, and its tendency to separate as fine dust and go off in the air whenever disturbed.

#### Recovery of Old Copper Solutions for Carbon Determinations.

Copper potassium chloride itself is not more expensive than other C. P. reagents usually used, by the pound, but as so much more of it is required per determination than other reagents are required for the estimation of other elements, it will form quite an item of expense when very many carbon determinations are made through that reagent. One pound of it will be used up in making a comparatively few carbon determinations, about 40 to 50 grams being required for each determination. It will therefore be found economical to retreat or "revivify" old copper solutions with a view to reusing them for other carbon determinations.

The following plan has been adopted by me after various experiments with excellent results: To 7 grams of potassium chlorate already in a 16-ounce flask add 400 of the old copper potassium chloride solution and 40 c. cm. strong hydrochloric acid. Heat to boiling and boil strongly for five or ten minutes. When cool filter through asbestos and it will be ready for reuse. A slight odor of free chlorine will not be hurtful. One-half of the 40 c. cm. strong hydrochloric acid used above is necessary to redissolve and keep in solution the re-oxidized iron salts, and the other half is calculated to supply the usual 5 per cent. of free acid to the solution. After revivifying five or six times it will be advantageous to throw them away, they having then become so nearly saturated with salts as to cause slow filtering on some steels.

#### Manganese in Iron and Steel.

Standard potassium permanganate solution, 3.90 grams of the salt in 2 liters of water. Each c. cm. equals 0.0010 gram manganese, or 0.20 per cent. of manganese when 1 gram of sample is weighed out and treated and one-half of the resultant solution is titrated.

The method: Treat 1 gram of drillings with 20 c. cm. nitric acid of 1.13 specific gravity for cast iron, or 15 c. cm. nitric acid of 1.20 specific gravity for steel, in a No. 2 Griffin beaker. Heat and boil until very low down in the beaker and the bulging center of the bottom of the beaker almost shows up. Cool and dilute a little with water; transfer with rinsings into a 300 or 400 c. cm. volumetric flask. Add emulsion of zinc oxide from a bottle, part by part, shaking the flask all the time, until the iron precipitates stiffly, then add a little more zinc oxide and shake vigorously, the precipitate showing a slight whitish tinge; and fill up with water to the mark. Pour all into a No. 3 Griffin beaker and stir well with a glass rod. Let settle for a few minutes and pour the rather (not excessively) milky supernatant liquid carefully into a 150 or 200 c. cm. volumetric flask (according as it has been from a 300 or 400 c. cm. volumetric flask) up to the delivery mark. One-half of either 300 or 400 c. cm. will represent ½ gram of sample. Pour it from the 150 to 200 c. cm. flask into a 16-ounce ordinary flask; bring it to a boil and titrate as usual with standard permanganate solution. If the burette reads 4.2 c. cm. then  $4.2 \times 0.2$  equals 0.84 per cent. Mn. I have a standard steel of 0.75 per cent. manganese which has been determined gravimetrically, with which I check up the standard permanganate solution when freshly made up or whenever in doubt of it, or to determine any correction needed in the routine work. For example, the permanganate solution in use at present would show on test with the standard steel 0.77 per cent. manganese instead of 0.75; therefore, I deduct 0.02 from all the results obtained by titration with this permanganate solution.

The advantages of this modified Volhard method are:

1. No evaporation with sulphuric acid is necessary.
2. This obviates any necessity for filtering off the iron.
3. It is desirable to have a slight excess of zinc oxide present when ready for titrating, as indicated by the moderately milky appearance of the liquid, as it increases the sharpness and permanency of the end reaction in titrating.

In case one is troubled with overtitrations from having to deal with samples running unusually high in manganese (over 2 per cent.) and widely differing in high manganese contents not approximately known, it would be practicable to titrate back, as is done in the Gay Lussac method of assaying silver bullion, with a standard solution of manganous chloride, which may be prepared by evaporating the proportion of 15 c. cm. standard permanganate solution down to 3 or 4 c. cm., adding a few drops of hydrochloric acid and boiling as long as chlorine comes off; then neutralizing with zinc oxide and diluting to 10 c. cm., when 1 c. cm. equals 1 c. cm. permanganate solution. This method of preparing a standard manganous chloride solution is due to Dubois and Mixer. If these gentlemen were correct in giving proportions of permanganate solution to convert into a standard manganous chloride solution, I would simplify and save time and labor of evaporating down the very dilute standard permanganate solution by taking of the dry permanganate salt equivalent to 1500 c. cm. of standard permanganate solution (2000 : 1500 :: 3.90 :  $x$  = 2.975 grams), dissolving it in 50 c. cm. water in a No. 3 Griffin beaker, treating as directed and finally diluting to 1000 c. cm., when 1 c. cm. equals 1 c. cm. permanganate.

### Graphite as a Lubricant.

Lubricants are divided easily into three classes: 1. Fluid, or oil lubricants; 2. pasty, or grease lubricants; 3. solid, or dry lubricants.

Of the many dry or solid substances used as lubricants at different times by far the most remarkable is graphite. The value of graphite as a lubricant is so generally conceded that it seems strange that its use is not more extensive. This mineral has attracted much attention of late, and a general knowledge of its merits and peculiar properties has been widely diffused. All users of machinery have knowledge of its value and use it in an emergency as a "cooler" of hot journals. While its use is general the amount used is not at all commensurate with its merits.

Graphite has a very low coefficient of friction. It is composed of but one element, carbon, hence is not affected by the action of acids, gases, alkalies and considerable changes of temperature. It oxidizes slowly at a temperature above a red heat. When subjected to the action of any of the conditions mentioned it retains constantly its peculiar property of low coefficient of friction. Graphite is a soft solid, and has the peculiar property of adhering readily, when subjected to light pressure, to metallic surfaces. This property causes it to fill the pores and to even up the roughnesses of metallic surfaces in rubbing contact. The surfaces so coated are thus covered with a veneer of allotropic carbon or graphite. This veneer not only reduces the coefficient of friction of the rubbing surfaces to practically that of graphite itself, but by reason of its inert properties protects those surfaces from the action of the vapors or other conditions to which they may be exposed. This applies particularly to cylinders, hence the special value of the use of graphite in cylinder lubrication, where high pressure steam, oil or gas is used.

For many years the accepted type of a lubricant was an oil or fat. These oily bodies, whether of vegetable or animal origin, are liable to become rancid and break up into other compounds under the action of the heat and vapor to which they are exposed, and often exerted a corrosive action on the metal surfaces.

Soon after the discovery of petroleum in 1859 mineral lubricating oil came into use. These hydrocarbon oils were free from the danger of corrosive action, but lacked "body," or viscosity under heat and severe service. This was followed by the compounding of the mineral oils by the addition of the "body" giving animal oils. These compounded oils are free from the danger of rancidity, as the animal oil is as completely sealed from contact with the air as though a substance were cased in paraffin wax. For many years these more or less highly compounded oils have met all the requirements of cylinder lubrication.

The economy of the use of high pressure steam, oil and gas in specially constructed engines has demanded

much study on the part of the mechanical engineer. The adoption and extension of the use of these types of engines has necessitated the carrying of a much higher temperature in the cylinders. All the oil lubricants lose much of their "body" or lubricating value, or either char or vaporize, under this higher temperature; and the question of insufficient lubrication and consequent deterioration is a serious one.

While the fluid lubricants have been perfected and improved to their present state the pasty lubricants or greases have also received much attention. In general these greases are compounds of a fatty acid with a base. The result of this combination is a soap which may be soluble or insoluble. This soap is dissolved or blended with a greater or smaller quantity of lubricating fluid according to the stiffness desired. The primary object of these compounds is to produce a lubricant of greater body than any oil, and also one that can be used in loose or open friction places. They are admirably adapted to many special conditions.

Solid lubricants are often mixed with these, the grease serving as the vehicle or carrier whereby the solid or dry lubricant is conveyed to the place of service. As a rule these pasty lubricants are not adapted to cylinder lubrication. The action of the heat and vapor in the cylinder breaks up the compound, leaving a charred or solid residue, which is liable to clog the cylinder ports. Of the solid or dry lubricants graphite has already been mentioned as the most remarkable. The others worthy of mention are talc, lycopodium powder and mica.

The files of the Patent Office attest the attention inventors have given to the use of graphite. Obviously a solid or dry lubricant must be fed in the form of powder. Having no means of feeding such a lubricant conveniently, yet appreciating the value of its low coefficient of friction, many inventors have attempted to use this mineral by mixing it with other substances to form part of the journal bearing itself. Over 125 patents for journal bearing compositions, &c., have been issued with graphite forming the principal antifriction part of the journal composition. Later many patents have been issued for various types of lubricators which were designed to feed graphite or some mixture of graphite into the cylinder or onto the bearing. Some of these are good, but the fact remains that lubricators are and have been for a long time mostly designed to feed oily lubricants. The fact that the prevalent existing types of lubricators are so designed is the principal reason why the use of graphite has not been much more extensive. Hence while mechanical engineers generally appreciate the value of graphite as a lubricant they use it sparingly and in cases of trouble, because it is troublesome to feed with the existing equipment.

Some months ago W. F. Downs of Jersey City, N. J., conceived the idea of extending the use of graphite by making a graphite mixture that would feed through the ordinary type of lubricators in general use. Recent tests of this mixture in some of our most prominent engine building shops have shown this attempt to be successful. The idea of the suspension of graphite in oil is not at all new, but still seems paradoxical. If it can be accomplished it certainly solves the question of the feed of graphite as a lubricant into many places where its peculiar properties make it specially valuable. Graphite by reason of its specific gravity, which is usually given at 2.3, tends to sink rapidly, even more rapidly than other substances of equal specific gravity on account of its smooth, crystalline surface and low coefficient of friction. Solid particles do not sink as fast in oil as in water, on account of the viscosity or "cling" of the oil and the resistance of the particles of oil to displacement. If the particles of graphite be coated so as to have viscous faces and the size of the particles be such that the ratio of extent of surface to weight be great, then the combined "cling" of the coated particles and of the fluid oil offer a force resistant to motion. Now if this resistant force be equal to or greater than the force of gravity then the particles of graphite will remain in place neither floating nor sinking, in fact be distributed or suspended in the oil. This is done in the manufacture of the compound or mixture of graphite and oil lately patented, and the use of graphite, particularly as a cylinder lubricant, will thereby be largely increased.



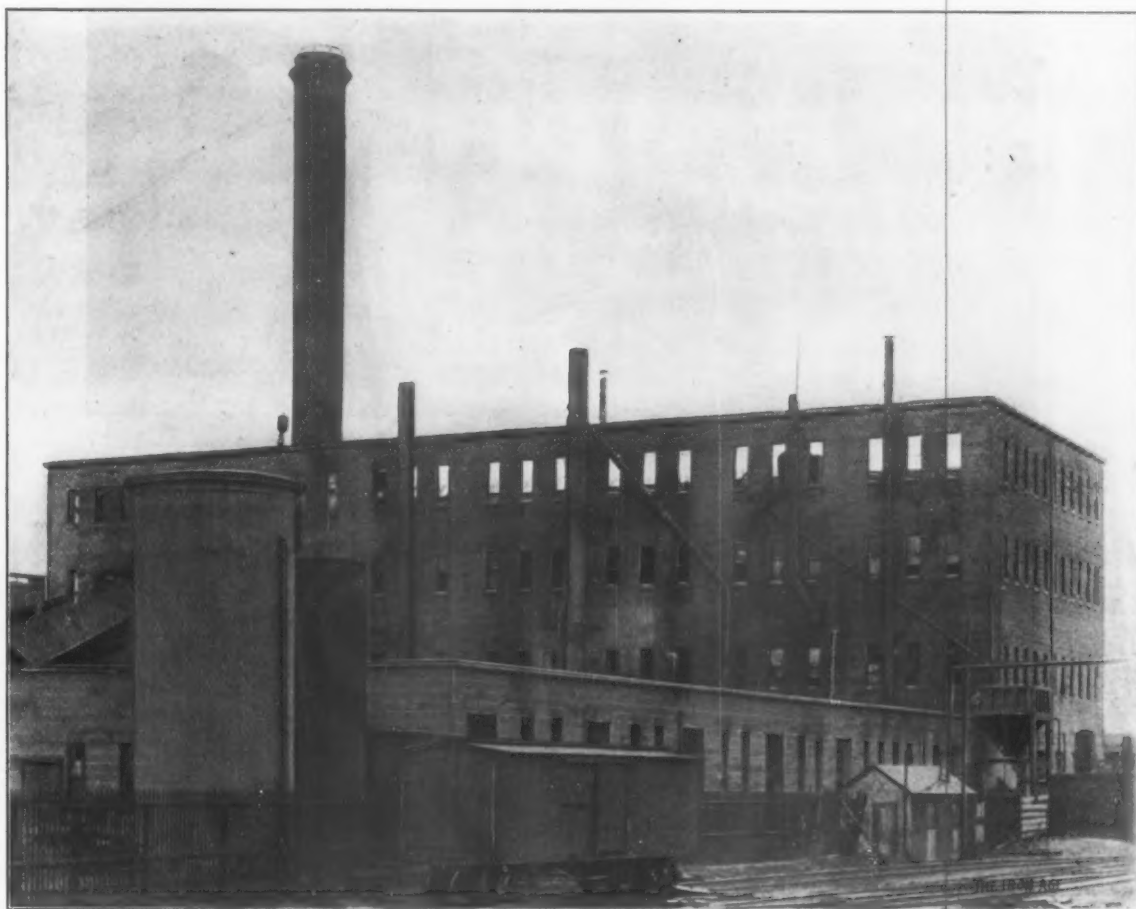
## A Successful Fire Test of Concrete Factory Construction.

### A Remarkable Illustration of the Fire Resisting Qualities of the Ransome Construction at the Pacific Coast Borax Company's Fire.

A practical demonstration of the fire resisting qualities of a form of concrete factory construction was obtained at the fire which visited the Bayonne, N. J., works of the Pacific Coast Borax Company. The fire occurred on April 12. It was a very hot fire, as it started from the bursting of an oil main and was fed by a great deal of inflammable material and quantities of chemicals and combustibles. That it was a hot fire is

4½ inches wide, 21 inches thick and 24 feet long. These are placed about 3 feet apart. Imbedded in the concrete floor directly over each beam is a ¾ x ¾ inch twisted bar of steel. Another square twisted bar 1½ inches in diameter is placed in the beam near the bottom. At intervals these two twisted bars are connected by a twisted U imbedded in the concrete. The floors are designed to maintain uniformly distributed loads of 500 pounds per square foot throughout. The floors, especially the fourth, were very much overloaded, however, at the time of the fire.

The columns are solid concrete, 17, 19 and 21 inches square in the third, second and first stories, respectively. The walls are 16 inches thick, with 10-inch hollow spaces in the center, thus leaving a 3-inch inner and outer concrete section, which are connected every 3 feet by a 3-inch concrete strip reinforced by a thin twisted steel



*Showing Appearance of Building After the Fire.*

#### A SUCCESSFUL FIRE TEST OF CONCRETE FACTORY CONSTRUCTION.

borne out by the quantities of fused cast iron from the machinery and copper from the dynamo and motors which were in evidence after the conflagration. Everything within the building was totally destroyed. Only such portions of the building itself remained as were constructed of concrete.

Ernest L. Ransome, who designed and constructed the building, says that the damage done to the concrete can be repaired at a cost of less than \$1000. The fire proved that one mistake made in construction was in building the roof and partition walls of wood. These are now being constructed of concrete.

The factory occupied a site about 200 x 250 feet. The principal portion was four stories high and the remainder a single-story wing. All foundations, footings, walls and columns were built of concrete reinforced with twisted square steel rods, a construction known as the Ransome system. A number of heavy partitions and the roof were built of wood. The floors were composed of 6-inch concrete slabs, supported by concrete beams

in the center, thus leaving a 3-inch inner and outer continuous horizontal twisted steel bar ¾ x ¾ inch and cross bars ¼ inch square every foot.

The concrete was made of Atlas Portland cement mixed with very fine unscreened basaltic rock, most of it broken to pass through a 1-inch ring, and mixed very wet with a chemical solution patented by Mr. Ransome, and intended to make it especially fire resisting. As the mixture contained considerable very fine stone, no sand was used. For the lower chords of the floor beams the concrete was made 1 to 6, the columns were made 1 to 5, and the balance of the work was done with concrete mixed 1 to 6½. When a week old the latter was tested, and it sustained a pressure of 1000 pounds per square inch on 3-inch cubes without breaking. The factory was built about four years ago in the winter, when the temperature repeatedly fell below zero. During the extremely cold weather salt was used in the mixture.

Ever since its completion the building has been subjected to severe carrying tests. Within a month after



completion the floors were loaded to a maximum of 1360 pounds per square foot. The weight of the building and its contents was about as great as the carrying capacity of the soft soil which supported it. The building contained many concentrated loads and considerable heavy

wooden bins stored with combustibles; on the lower floor one room was completely filled with stacks of empty heavy wooden barrels reaching to the ceiling. These were completely consumed.

Adjacent to the one-story section of the factory there

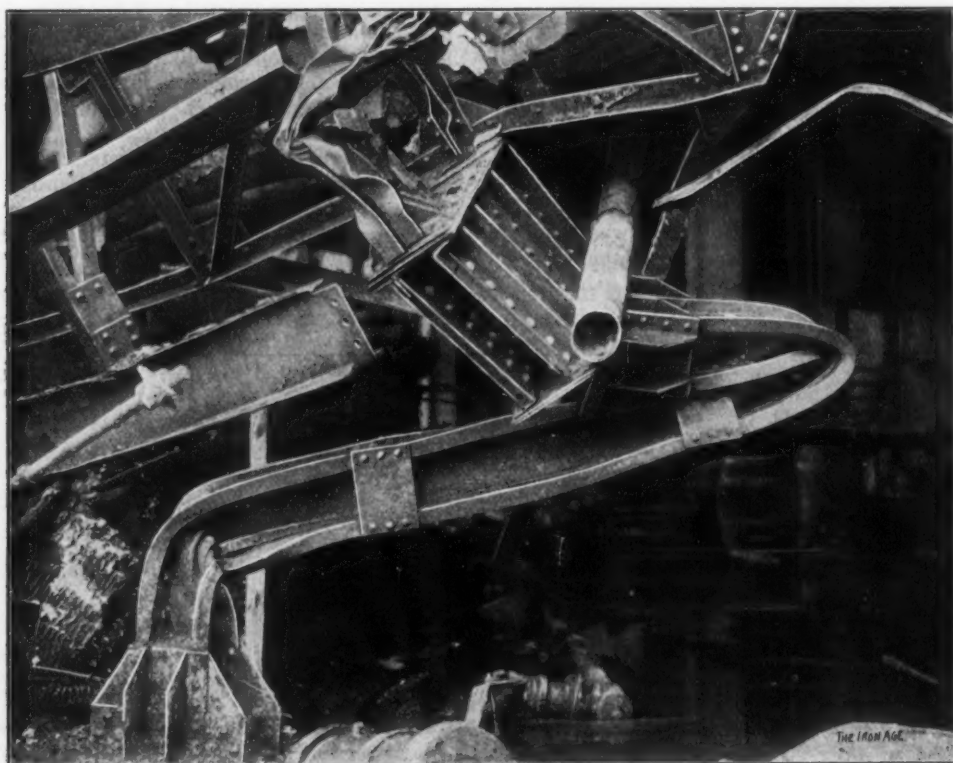


Fig. 2.—Effect of Fire on Steel Structure.



Fig. 3.—Where Fire Was Hottest; Showing Slight Effect of Fire on Concrete Construction.

#### A SUCCESSFUL FIRE TEST OF CONCRETE FACTORY CONSTRUCTION.

machinery, such as a 35 horse-power grinding mill on the fourth floor, but nevertheless it was remarkably free from vibrations and never showed any defects in construction. Besides the wooden partitions, roof, stairs, &c., the building contained much of an inflammable nature at the time of the fire. There were numerous

wooden bins stored with combustibles; on the lower floor one room was completely filled with stacks of empty heavy wooden barrels reaching to the ceiling. These were completely consumed. The effect of the heat on it is shown in Fig. 2.

The fire originated in the lower portion of the factory.

After burning its combustible contents and spreading to the steel structure, it burned through the wooden partition to the four-story structure. It swept through the first floors, up the elevator shaft and stair wells, and soon the entire building was ablaze. The lower floor was a pool of blazing oil. There was much of a combustible nature on the fourth floor. On the roof, supported by 10 x 10 inch pine stanchions, was a series of large tanks. They were supported 14 feet above the

injury whatever with but one exception. One of the long steel tanks fell with one corner foremost and directly upon a conveying machine. The force of the fall drove a portion of the conveying machinery through a small section of the floor. This tank is shown in Fig. 4, and the hole made in the floor is shown in Fig. 3. This tank was filled with liquid, and when it fell weighed about 83 tons. A large portion of the contents, doubtless, was spilled in the fall. The other long steel tank fell flat, and

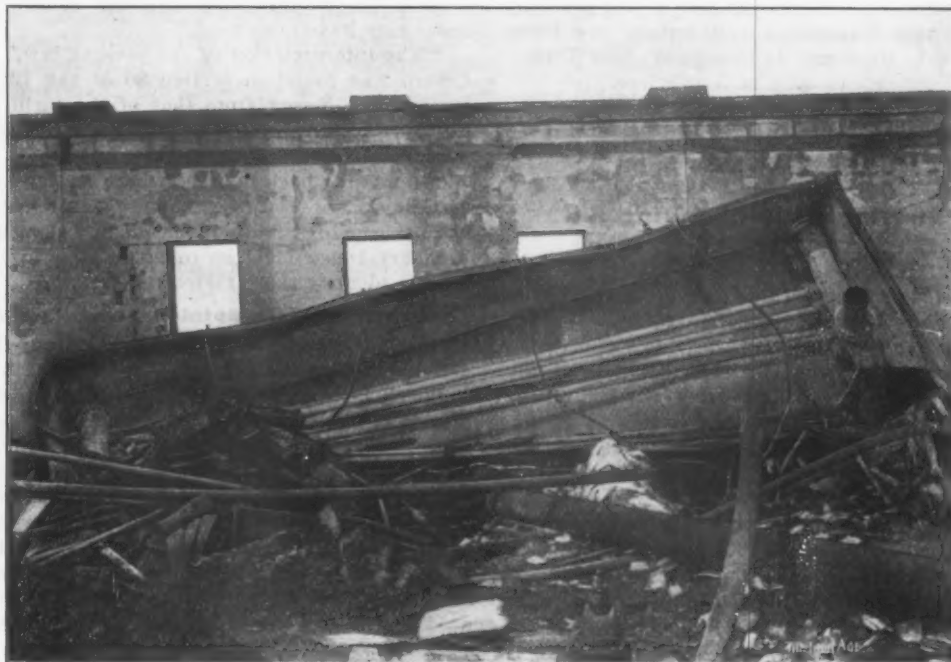


Fig. 4.—Steel Tank Which Fell 14 Feet to the Fourth Floor and Caused the Only Break Made in the Flooring.



Fig. 5.—Another Steel Tank which Fell with Portion of Roof on it without Injuring the Floor.

#### A SUCCESSFUL FIRE TEST OF CONCRETE FACTORY CONSTRUCTION.

fourth floor. Three of these tanks were made of steel. One was circular, 10 feet in diameter and 8 feet high, and the other two were about 14 feet long, 5 feet wide and 4 feet deep. There was also a dust collector, a chamber built of concrete, 50 feet long and 6 feet wide and high. It weighed 45 tons.

Shortly after the fire reached the fourth floor all of the wooden beams supporting these tanks and the roof were burned through and the tanks came crashing to the fourth floor. The floor sustained them without any

did not so much as crack the concrete floor. The 45-ton concrete dust chamber also fell flat and was shattered to fragments in the fall, but did not affect the floor in the least.

As a result of the extreme heat the plaster on the walls was cracked off, and some damage was done to the filling on top of the main floor slabs. There was no damage incurred, however, which will necessitate the taking out or rebuilding of any portion of the concrete work. There was no damage or distortion to any of the walls



or columns or any cracks, deflection or other injury to the floors with the one exception noted above.

A great quantity of cold water was thrown on the structure during the fire. That the floors were not cracked was evidenced by the fact that a good deal of water remained for some depth on the floors without leaking through except at regular openings. The building cost about \$100,000. Work has already been commenced in repairing the comparatively slight damage to the concrete and the building of concrete partition walls and roof. A 150-foot concrete chimney, which is shown in the first illustration, was not damaged. The building was designed and constructed and repairs are being made by Ernest L. Ransome, 11 Broadway, New York.

## The Proposed Reform of the Drawback Laws.

### Another Hearing on the Lovering Bill.

WASHINGTON, D. C., May 6, 1902.—The Ways and Means Committee on the 30th ult. took up the Lovering bill, providing for certain important reforms in the drawback laws, for the purpose of hearing Deputy Collector James A. Cryan, who had been detailed by the Treasury Department to appear before the committee as a drawback expert. Mr. Cryan's testimony was distinctly adverse to the bill, which he declared was unnecessary, because manufacturers at the present time were enabled to secure without difficulty drawback of duty paid on the imported material used in their exported products, and generally speaking, drawback claims were liquidated within 30 days. It is obvious, of course, that Mr. Cryan could not have made so specific a statement with regard to all manufacturers who are now using, or who would be glad to use, imported materials with benefit of drawback, and the impressions which his statement made upon those possessing some familiarity with this subject was that he had in mind chiefly such manufacturers as export practically the entire output of certain plants, or who employ only foreign material in their products.

The members of the Ways and Means Committee have given very little attention to the subject of the drawback laws, which have not been changed in any important particular since 1890, and the cross examination to which they subjected Mr. Cryan failed entirely to bring out the real difficulties in the way of the execution of the existing statutes; therefore, while the witness' statements were undoubtedly made in good faith, they were chiefly wide of the mark. Mr. Cryan placed great stress upon the opinion of the Attorney-General rendered in 1898, permitting the records of manufacturers to be used as evidence with regard to the imported materials employed in the production of goods for export, but he failed to call attention to the fact that this opinion and the regulations thereunder have not relieved manufacturers who are engaged simultaneously in producing goods for both foreign and domestic trade in the same plant. The difficulties encountered by such manufacturers were very fully set forth by President F. W. Wood of the Maryland Steel Company, Walter Wood, the well-known iron pipe manufacturer, and others before the Ways and Means Committee on April 2, showing that it is practically impossible to determine the exact percentage of foreign material in any given product unless the materials used have been separately stored and worked up, which necessarily involves great expense.

### A Drawback Expert Opposes the Bill.

Mr. Cryan stated at the outset that he had been in the customs service 30 years, and for a number of years had served in connection with drawback matters as chief clerk, deputy collector, &c. Continuing, he said:

"My personal view is that the bill is unnecessary, so far as the first section is concerned, that the present law is enforceable, and that as far as the port of New York is concerned we are paying drawbacks on all the articles specified in this bill. We have no trouble there in identifying them and we pay the claims."

Chairman Payne then stated his understanding regarding the necessity of the proposed law, as follows:

"What is claimed in respect to this question is that in the process of manufacture the imported material necessarily becomes mixed with the domestic, and they are not able to identify it so as to make affidavit that the finished article is manufactured from the imported material, and they only get a portion of the drawback they would get under the law if they could make that identification. This bill allows them a drawback if they have imported an equal amount of foreign material as that used in the manufacture, although some domestic material may have been used."

"The interpretation of the present law," replied Mr. Cryan, "as found in section 30 of the Dingley act is somewhat different from that of the tariff of 1890, although the terms of the statute are about the same. It might be true to state that there was some difficulty in obtaining drawback in cases where foreign and domestic materials were used in combination—for instance, in the use of lead ores, both imported and domestic—for the Treasury Department so construed the law that it was hard to identify these materials."

### Attorney-General's Opinion Assists Manufacturers.

"In July, 1898, however, the Attorney-General rendered an opinion wherein he held that these articles could be identified by the manufacturer's records, and that would be sufficient. The Treasury Department has since acted accordingly; they allow identifications to be made from these records, and we have no difficulty in settling these drawback claims, so far as New York is concerned. This opinion of the Attorney-General was rendered in regard to what is known as the Kansas City Smelting & Refining Company, who use some foreign and domestic ores in combination. In cases where they used a small percentage of domestic ores to get better results the Department had refused to allow rebate. The Attorney-General, however, gave it as his opinion that the company's records could be resorted to for the purpose of showing the quantities and ascertaining the domestic materials used in the combination. The same rule prevails as to pig iron, and we have a number of regulations adopted by the Department in which the method is recognized in practice."

"Suppose," suggested Chairman Payne, "I were manufacturing machines of both imported and domestic materials, but could not tell what material entered into any particular machine. Could I then get this drawback unless I swore that the exported machines were made from imported iron?"

The witness replied that since he had been summoned to appear before the committee he had consulted a number of prominent manufacturers, who said that even if they were not obliged to deal with the Government, as a matter of good business practice they would keep their books in such a way that they could always know just what particular materials, whether foreign or domestic, were used in the manufacture of articles for export.

"But take the case of D. M. Osborne & Co.," suggested Mr. Payne. "They export harvesting machinery, and one-third of their product comes through the port of New York. They say that in the process of manufacture they are not able to so trace the imported materials as to keep them separate from the domestic, and hence they can get no drawback when they export their machines. On the other hand, it would cost more to so trace the materials than the drawback would amount to. I have heard it intimated that other manufacturers, with more elastic consciences, were able to trace their materials sufficiently to make the necessary affidavits. Now, assuming that there is a need for this legislation, we would like to have your opinion as to how it would operate in practice, especially as to whether the Government's interests would be protected."

### Difficult to Protect the Government's Interests.

"The bill," replied Mr. Cryan, "provides that a like quantity and value of domestic material may be exported to equal the foreign materials imported. Now, I do not know, of course, what kind of regulations the Secretary of the Treasury might adopt in case the bill became a law to make it workable, but I do know this



that in the case of imported goods the Government has the greatest difficulty and is required to exercise the utmost watchfulness to prevent undervaluations. The law and the regulations provide that the owner or consignee of the merchandise shall make an affidavit showing that these goods were purchased at the wholesale price and invoiced on the basis of foreign market value on date of shipment; also that all charges and costs incidental to placing the goods in condition ready for market are correctly stated. Even these affidavits are not accepted by the Government, but the merchant is obliged to give bond. After the goods arrive here the Government has a corps of experts on each line of goods to examine them closely and carefully and compare the prices with those of other importers in the same line to ascertain if the values are correctly stated, and if not, to make proper additions to make the market value.

"Now, I do not know whether the Government or this committee would contemplate a very largely increased force to ascertain the values of domestic goods used in exported products, to see that they would be equal with the values of the imported materials as provided by this bill. Under the proposed system it looks to me as though it would be pretty hard for the Government, unless such a corps of experts is provided, to know that the law as to values and quantities is complied with."

Representative Tawney suggested that it "would be necessary to ascertain what had actually become of the foreign material imported to determine whether it had gone into domestic consumption or had been used in the manufacture of exported articles, so as to prevent drawback claims being presented for exported goods made of both imported and domestic materials," to which the witness replied he thought there would be considerable danger of payment of double drawbacks on single importations of raw materials. "It would also be necessary," said he, "to provide for a method of calculating values of materials. For instance, in the case of a lot of foreign material imported two or three years before it was used, there might be such a change in price as to upset all the figures."

Chairman Payne suggested that this difficulty could be prevented by specifying the time within which the material must be imported and duty paid, limiting it to three or six months prior to manufacture, to which the witness replied that such an arrangement might be made that would work satisfactorily.

#### **Working of the Present Drawback System.**

Mr. Cryan then produced a statement showing drawbacks paid on the leading articles exported during the fiscal year 1901, amounting to \$5,257,981, of which \$3,134,745 was paid at the port of New York. The total duty paid on these materials amounted to \$5,709,154, leaving a balance in the Treasury of \$451,173 over and above drawbacks paid. He then described briefly the ordeal of the exportation of goods with benefit of drawback.

"The regulations of the Department," said he, "provide that at least six hours prior to the lading of the goods on the vessel or car, the claim of the exporter must be filed with the collector of the port. Then 60 days are allowed, and, if necessary, six months, to enable the exporter to complete his claim and to identify his imported material. This he does not have to do when he sends in his claim, but the Government gives him all the time that is necessary to secure the required data."

Representative Tawney questioned the witness at this point with regard to delays experienced by exporters in obtaining drawbacks and secured some interesting admissions.

"I would like to ask you," said Mr. Tawney, "if the present objection to the enforcement of the existing drawback law is not because of the delay incident to the collection of claims, and largely to the insufficient force employed in the New York office for the adjustment of these claims?"

"I will have to say that that was practically true at one time at least."

#### **Drawback Claims Pending for Years.**

"Is it not a fact that in the Naval Office great numbers of claims have been pending for several years,

owing to the fact that there is not sufficient force to examine and adjust them?"

"I do not think several years have elapsed. Of course, the Naval Office is a co-ordinate branch of the Collector's Office, and I do not know that it would be becoming of me to criticise it. I think it is practically abreast of current business, though there may be some delay and some cause for complaint."

"Is there any necessity for these claims to pass through two offices? Is not this practice responsible for much of the complaint against the Treasury Department and the present system of drawbacks?"

"I do not think the complaint is general, but I have heard some complaint."

"Do you know of any complaints that have been pending for as much as two years?"

"I do not think there have been any such cases unless there were some questions involved outside from the general business—some defect in the papers, or some regulations not complied with."

"I know of some exporters in Minnesota," asserted Mr. Tawney, "who have had claims for as high as \$60,000 tied up for several years."

"I think I remember the cases you speak of," said the witness. "There was a time when many goods went through without being supervised by customs officials, and there was some delay. The Treasury Department has since manifested a very liberal disposition with reference to the business. So far as the Collector's Office to-day is concerned, any exporter who complies with the regulations can obtain his drawback within 30 days after the clearance of the export vessel. If the exporter will do his part, so far as the Collector's Office is concerned, I will guarantee he will get his money within 30 days."

"You do not, then, regard the Lovering Drawback bill as likely to simplify the allowance of claims or shorten the time?"

"I do not see any necessity for this legislation. If it is difficult at present to identify the imported materials, how are we to identify the domestic material in order to determine its value?"

#### **Cost of Making Drawback Allowance.**

Referring to the provisions of the pending bill allowing drawback of 100 per cent. instead of 99 per cent., as at present, Mr. Cryan said that, in his opinion, 1 per cent. would not cover the cost to the Government of making the allowance of drawback claims. He had not made any accurate figures on this point, but on account of the large number of small claims presented, some of which cost as much to liquidate as the amounts paid to the exporters, it was probable that the deduction of 1 per cent. did not meet the entire expense. Chairman Payne then asked the witness what objection there would be to relieving the manufacturer of the necessity of identifying his raw material, or of permitting him to use domestic material if he had imported or purchased an equivalent amount of foreign material, to which he replied that he thought, if the pending bill was passed, "all sorts of schemes would be resorted to to get back the duty paid on imported materials."

"In a year," said he, "I think you would find very little remaining in the Treasury; it would be drawn out on account of exportations, either legitimate or otherwise—in my opinion, considerably otherwise. I do not believe it could be stopped by the Treasury Department."

Referring to the statements made before the committee on behalf of certain manufacturers of locomotives and engines, Mr. Cryan said:

"I have seen the report of your hearing on this bill at which something was said by certain people who are interested in the exportation of locomotives and engines. I have here a list of the people who manufacture locomotives, engines, &c., and to whom we allow drawbacks at the port of New York on the various parts of these locomotives and engines. I wish to state, therefore, that about 20 firms located in different parts of the country have filed claims and have all received their drawbacks, and there are no unsettled claims on account of their shipments."

#### Believes Present Regulations Sufficient.

In conclusion, Mr. Cryan said that he believed the opinion of the Attorney-General referred to furnished all the relief manufacturers really needed, adding:

"Shortly before I came down here a prominent manufacturer who exports white lead in oil manufactured from imported pig lead discussed this question with me, and I took occasion to show him the opinion of the Attorney-General. He at once declared that nothing more was wanted in his line of business to enable exporters to secure all the drawbacks claimed by them. He said that if his firm could have secured such a decision five or six years ago it would have saved them at least \$75,000, as they had been obliged to put up a special building in which to manufacture their goods for export. I think this opinion is generally shared by manufacturers in other lines."

As no opportunity was afforded at this hearing for a cross examination of the witness by parties familiar with manufacturing conditions in the export trade, the friends of the bill desire that the committee shall give another hearing in order to permit testimony to be presented in rebuttal of certain of Mr. Cryan's statements. Representative Lovering, the author of the bill, is not at present in Washington, and no arrangements will be made until he returns in the course of a few days. The advocates of the measure are also anxious to bring out certain facts with regard to the necessity for the enactment of that provision of the bill which allows drawback on articles manufactured to be used as ships' stores, such as spare parts, lubricating oils, &c., on which drawback is now denied under a recent decision of the United States Supreme Court, for the reason that the goods are not actually landed in a foreign country.

W. L. C.

### Central Pennsylvania News.

#### Local Changes and Conditions.

HARRISBURG, PA., May 7, 1902.—As predicted in these columns a few weeks ago, the Central Iron & Steel Company have taken the Paxton furnaces, the sale having been made May 1 by the Paxton Iron & Steel Company, owned by the McCormick estate. The price paid was \$400,000, and the purchasers will proceed to operate the furnaces in connection with their fine rolling mill plant, which will within a year or so have the addition of a six-furnace open hearth plant. The Paxton furnaces are among the best known stacks in Central Pennsylvania, the original furnace having been built by James McCormick in 1855, and the second added in 1872. The old furnace is 75 x 14 feet, and No. 2 is 80 x 14 feet, the latter now undergoing some extensive alterations, to be completed by August 1. The capacity of No. 1 furnace is 125 tons, and of No. 2 175 tons per day.

The shortage of fuel and raw material combined makes the only drawback to a season of almost unprecedented prosperity in this part of the State, some plants being greatly inconvenienced by the slowness with which coal, ore, steel and iron are delivered. The Pennsylvania and other steel companies having their own cars are in better shape than the rest, some of which have either been compelled to suspend for short periods until their stocks can be replenished or to decline orders. The latter case has been reported from two works in this city alone, and managers of other plants are fearful of encountering the same state of affairs.

Not much is being heard about this city concerning the wage rate for the puddlers, but in the Schuylkill Valley there have been some conferences, and one Pottstown firm have raised their tonnage rate to \$4.50. It is said that several others have agreed to do the same this month. If the present state of activity continues there may be but few shut downs this summer.

Considerable importance is being attached to the coming transmission of power throughout the Lower Susquehanna Valley by the great electric works being built at and near York Haven. It is the hope of the promoters to furnish electricity to many of the cities. Some tenders have been made to manufacturing concerns to furnish power, and if the present plans are car-

ried out many plants will be run by power generated by the rapids of the Susquehanna, many miles away.

#### Sundry News Items from Various Towns.

The sale of the Lorain Steel Company's motor department at Johnstown to the Westinghouse Company has been followed by the purchase of the Cambria Steel Company's Northwest department by the Barrett Mfg. Company, who are to manufacture tar paper in the new acquisition. There will be an immediate start of the plant under the new ownership.

Steps are being taken to incorporate the company formed to operate the Lebanon Valley Furnace at Lebanon, and application will be made for a charter. This stack has been run for years by J. & R. Melly, and it is understood that the Melly interests are to be important factors in the company, which will also include the Grubbs. The new company will be known as the Lebanon Valley Furnace Company.

The transfer of the Lebanon Rolling Mill Company's properties at Lebanon to the newly incorporated Lebanon Iron & Steel Company was made this last week, and Samuel E. Light, the president of the old company, will likely be active in the affairs of the new corporation. The company's properties consist of a large rolling mill at Lebanon, where there is also under construction a steel plant. The company also have a forge. Tubing will be added to their products.

Some improvements are contemplated in the works of the Parkesburg Iron Company, at Parkesburg, Lancaster County, but they are not yet announced. The plant has been busier than ever this last year.

The Pennsylvania Agricultural Works at York have been so busy that they have been compelled to work overtime. Large shipments have been made.

It is reported that the Philadelphia & Reading Railway Company will build a plant for the repair of steel cars at Reading, where they have large locomotive shops. The company have been adding many steel cars to their equipment, and the repair plant is greatly needed.

The organization of the Superior Chain Company was effected here last week and work started with a rush on the plant at Marysville. The company have a capital of \$25,000, and the officers are Logan A. Marshall, York, president; S. S. Leiby, Marysville, treasurer; J. Harper Seidel, Marysville, secretary, and George A. Walker, Marysville, superintendent of plant. These gentlemen, with John W. Beers, P. F. Duncan, J. A. Seidel, Jacob S. Bitner, H. J. Deckard, E. J. Sellers and W. H. Leonard, are directors. The managers hope to be able to fill orders this fall.

Albright Sons & Co. are building an addition to the pipe foundry of the plant in Allentown and a 125 horsepower engine will be installed. The Caloric Heater & Mfg. Company, a new concern, will locate a large plant near the same town in a short time. The plant will consist of a large foundry, a storage and pattern building and an office. The company have been doing business in Easton for some time.

It is stated that the Sterlingworth Railway Supply Company, who have about disposed of their brake beam department to the Chicago Equipment Company, will enlarge their plant near Easton if arrangements can be made. The main offices have been removed to Philadelphia.

#### New Corporations Chartered.

Corporations chartered from April 15 to 30 by the State Department include the following: Lawson Mfg. Company, Homestead, to manufacture stoves; capital, \$25,000; directors, L. S. Lawson and W. H. Malley, Homestead, and W. H. Johnson, West Brownsville. Century Stove & Mfg. Company, Johnstown; capital, \$100,000; directors, Rowland S. Wilson and Robert Monroe, Pittsburgh, and Edric C. Warren, John H. Waters and Samuel B. Waters, Johnstown. Bing Foundry Company, Philadelphia; capital, \$5000; directors, J. Howard Bing, N. W. Bing and Frank Mills, Philadelphia. Keystone Valve & Mfg. Company, Pittsburgh; capital, \$20,000; directors, Hugh McCulley, W. H. McCulley, W. A. Larimer, John A. Logan, S. McKay and J. D. Riley, Pittsburgh; E. A. Griffith, Knoxville, and M. P. Schooley



and H. E. Keyes, Homestead. Hileman-Jones Company, to manufacture metallic packing, Pittsburgh; capital, \$10,000; directors, H. Hileman, Pittsburgh, and C. M. Lawson, A. J. Wild and William Sheehan, McKeesport. Beaver Falls Supply Company, Beaver Falls; capital, \$15,000; directors, B. F. James, S. Louthan, Albert M. Jolly, S. L. McAdams, W. J. Davidson and W. S. Morrison, Beaver Falls, and A. J. Bell and A. J. Gilbert, Pittsburgh. American Nickel Works, Philadelphia; capital, \$5000; directors, Joseph Wharton, R. Roger Haydock, J. B. Lippincott and Harrison S. Francis, Philadelphia. C. L. Chapman Cream Separator Works of Erie; capital, \$41,000; directors, C. L. Chapman, J. T. Fletcher and E. T. Moore, Erie, and D. McGraw, Little Falls, N. Y. Nittany Iron Company, Bellefonte; capital, \$150,000; directors, J. W. Gephart, F. H. Clemson and L. T. Munson, Bellefonte; Archer Brown, East Orange, and William Sampson, New York.

## The Amalgamated Scales.

At the convention of the Amalgamated Association in Wheeling, W. Va., last week, the recommendations of the Wage Committee that the basis of scales as signed by the committee representing the Amalgamated Association, the Republic Iron & Steel Company, the American Sheet Steel Company and the American Tin Plate Company, were adopted. The following changes in the foot notes to the various scales were suggested:

### Memoranda of agreement:

The second clause in the memoranda of agreement was amended by striking out the figures "160" in the second line and inserting "130" instead.

### New clause desired for memorandum of agreement:

"5. Finishing mills will be allowed to work three turns when practicable. On finishing mills working or desiring to work three turns, eight hours shall constitute a day's work. Rolling shall not start earlier than 5 a.m. Monday morning, and first furnace shall cease charging at 11.30 a.m. on Saturday. The last furnace shall not charge later than one hour after the first furnace and close the week's work. On all mills working three turns a third roller shall be employed."

### Clause 6:

The fifth clause was changed to read:

"Resolved, That all 10-inch guide and hoop mills with one furnace averaging \$35.00 per turn, or with two furnaces \$65.00 per turn, on a 9¼-hour system, based on a 1-cent card, that the eight-hour system be adopted.

"Resolved, That on bar and 12-inch mills averaging 85,000 pounds per turn on two furnaces, or 60,000 pounds on one furnace, on the 9¼-hour system, that the eight-hour system be adopted."

### BOILERS' SCALE.

#### Amendments desired:

Foot note 24 changed to read:

"That puddlers and scrappers shall lose only the amount over the limit of a ball."

The following to be added to foot note 25:

"And when heats must be thrown out the company shall bloom the same if possible."

#### New clauses desired for boilers' scale:

"26. That where pipe is worked in cinder bottom furnaces, mixed with light scrap, it shall be cut 3 inches long for charging."

"27. That on all puddle mills where they run a bug-gy, the company shall hire a man to run same."

"28. When working one-third wrought iron turnings, or one-third light scrap with two-thirds swarth on cinder bottom furnaces, the limit shall be 4200 pounds."

"29. When swarth and scrap is worked on cinder bottom, and swarth is wheeled in and dumped in a pile, and scrap is wheeled in one ball at a time, scrap weighing 80 pounds or less, that the price for working such mixture shall be seven-eighths (7/8) the price of bolting."

"30. That where hot cylinder clay or ganister, fix, or any other substitute for pulverized ore is used, the price shall be 50 cents per ton extra, except hot ore fix, which shall be \$1.00 per ton extra."

"31. That all mills where screenings are given to puddlers when working several, that the full bolting price be paid, and that such screenings cannot be classed as mixed material."

### MUCK OR PUDDLE MILL SCALE.

Recommended that the words "or hot scales" be inserted after the word "bank" in the fifth line.

It was decided that foot note 5 be amended by making it read:

"On mills averaging 16 tons or less per turn in two weeks, the company shall pay the drag outs."

### PILES ON BOARDS.

"4 (new). That all piles on board furnaces where average output is 24,000 pounds or over shall work three turns where the puddle mill works three turns."

### BUSHELING ON SAND BOTTOM.

"6. Two bundles shall be the limit of each ball."

"7. That when light scrap is worked without turnings, 20 cents extra above light scrap price shall be paid."

"8. That when heavy scrap is worked alone on sand bottom, without turnings, the price to be 20 cents above the price paid for busheling."

"9. That when a scrap bloom goes through first pass in the rolls the scrapper to be paid for the same."

### KNOBBLING SCALE.

No changes desired.

### HEATING AND SHINGLING SCALE.

No changes desired.

### BAR AND 12-INCH SCALE.

"7. The words 'all except' on straight two-high bar mill is added to foot note 7 of bar mill scale."

"8. To strike out the words 'excessive to' in the third line of foot note 8 and the following after the word 'paid' in the last line of said foot note—and where the same are subsequently rolled into other sizes, thereby taking the place of billets, and when they are used for plates off a solid or other piles, 10 per cent. less than scale price shall be paid."

#### New clauses:

"12. Company shall pay firemen on all heating furnaces."

"13. That night turn roller shall receive not less than one-half the straight price for rolling."

"14. That where a mixed heat of iron and steel is worked in heating furnace that the price of iron shall be paid."

"15. That company furnish heater a competent man to help turn iron in furnace on piles weighing 300 pounds or over."

"16. That the company furnish two strainers on guide rounds when worked on a bar mill."

### SCALE FOR WORKING PIPE OR SKELP.

No change recommended.

### GUIDE, 10-INCH, HOOP AND COTTON TIE SCALE.

Substitute for foot note 13: "Wages of all hands working on guide, 10-inch, hoop and cotton tie mills not provided for in scale shall rise and decline with card rate."

#### New clauses:

"14. When working non-uniform billets, such as cuttings, cobbles and scrap yard billets, 21 cents for rolling, 10½ cents for heating and 5¼ cents for roughing and catching, each, shall be added to the straight price per ton for working piles."

"15. That the price for three-quarter No. 18 star iron be as follows: Roller, \$3.53; heater, \$1.76¼; rougher and catcher, each, 96 cents per ton."

"16. Company shall pay fireman on all heating furnaces."

### PLATE AND TANK SCALE.

No changes desired.

### SHEET MILL SCALE.

Substitute for foot note 4: "All sheet iron or sheet steel shall be weighed by the company after being sheared and opened, and the company shall furnish the complete weight of each turn to the roller, or put the same in a convenient place."

### SHEET MILL HANDS' SCALE.

Add to foot note 11, these words: "This to apply only to sheets 60 inches long and shorter lengths."

### ROUGHING AND CATCHING ON SHEET AND JOBBING MILLS.

The above change to be incorporated in the roughers' and catchers' scale.

### TIN MILL SCALE.

"1. That the screw boys do not bundle any scrap ends, scrap to be bundled by the company."

"2. That all tin mills be paid at least every two weeks."

"3. That as a counter proposition to the three years' scale we propose to agree on conditions that we get the Cleveland 1900-01 scale and foot notes, with the same conditions as then prevailed, where now practicable."

"4. And when in the judgment of the manager and the mill committee the work is too heavy for the catcher, extra help shall be furnished."

"5. That when dirty bars are supplied for tin mills the company shall furnish a man to sweep them, and that the crew shall not be held responsible for dirty iron. The crew shall be paid for production per mill for such iron put in by the company."



"6. That no more level hand jobs be given in tin mills, and level hand men be singled out as soon as a vacancy occurs."

"7. That 10 per cent. extra shall be paid for 40 gauge when doubled three times.

#### MOREWOOD STACKS.

That the Morewood scale shall end July 15.

#### SHEET AND TIN BAR SCALE.

New foot note:

"1. That the price paid for drag down on sheet bar mill be one-third the price of heater's price."

"2. That the drag down from furnace to rolls on sheet bar mill have a scale of about 14 cents per ton.

Conferences will be held at an early date between wage committees representing the Amalgamated Association and conference committees representing American Steel Hoop Company, Republic Iron & Steel Company, American Tin Plate Company and the American Sheet Steel Company. However, no date has yet been set for these conferences.

### New Publications.

#### Furnace Draft: Its Production by Mechanical Means.

By William Wallace Christie. Published by the author, Paterson, N. J., 1901. Price, 50 cents.

This little monograph opens with a series of definitions, in which mechanical draft is shown to be either induced, or forced, or a combination of both, the forced induced or the forced natural, in which fan and chimney are both used. The author quotes from James Howden, an English authority, who enumerates seven advantages which are claimed for mechanical draft, as compared with natural chimney draft. It is evident that in some particular cases mechanical draft has very decidedly superior points. For example, the prevention of heat being radiated from furnaces and ash pits into the stoke hold of a ship; the prevention of boiler cooling by an inrush of cold air every time the furnace door is opened; and less discomfort in stoking, the stoke hold being constantly filled with fresh air.

Mr. Christie, who rather prefers chimney draft, states the case very fairly all through, and impartially shows the good and bad points of each method. The ease with which a forced draft outfit can be installed after being ordered on short notice often leads to its adoption. Economy in burning cheap fuels is frequently put forward as an advantage peculiar to forced draft, whereas the cheap grades of fuel may be satisfactorily burned in a properly designed boiler furnace using natural draft. The sizes of furnace and chimney must be carefully worked out for the fuel to be burned and the work to be done. Good mechanical draft and bad chimney draft are not fairly comparable things.

Mr. Christie points out that, by means of mechanical methods and the forcing of a few boilers, it may be possible to dispense with one or two boilers in a plant, yet by so doing the efficient rate of evaporation of water per pound of coal suffers very seriously. The user, he says, must decide which is the more desirable—to get most out of the coal for its cost, or the most out of the plant for its first cost. Wear and tear are greater with forced boilers, and in the matter of being able to do repairs economically there is no advantage in having smaller boiler plants.

Some interesting facts and figures are quoted from a paper by the late E. B. Cox, read before the New England Cotton Manufacturers' Association in 1895. It appears that 1 pound of coal burned with forced draft wastes 18 pounds of air and 1126 British thermal units are lost. One pound of coal burned with natural draft wastes 24 pounds of air, with 2520 British thermal units lost. This amounts to a heat loss of 7.93 per cent. for forced draft, against 17.74 per cent. loss for natural draft, or a gain of 9.81 per cent. in favor of forced draft. If, however, the amount of air supplied by chimney draft is made to equal that of the blower, as it can be, then the operating expenses of the latter must turn the scale in favor of the chimney.

"Forced draft used alone generally results in higher temperature of the escaping gases than is usual with natural chimney draft." This is an objection to forced

draft, and naturally leads to some observations on economizers. It seems that in America economizers are not installed as extensively as they are in Europe, for the reason that the European design of boiler costs less per horse-power than the American boiler. Americans put in more boiler and less economizer. We are told that the life of a forced draft fan in constant use is about 15 years. A well cared for steel chimney will last from 20 to 25 years, and a good brick chimney 100 years.

This little book of 42 pages and an index contains numerous tables, results of tests, general data on the subject, and many interesting and useful facts. We think that had it been divided into chapters or paragraphs with headings it would have been better, and the cover should have been more substantial. It is written, however, without bias, and the conclusions of the author may perhaps best be stated in his own words: "Whenever it is at all practicable to do so, a chimney, or what is to be preferred, chimneys in multiple, should be used. . . . It would seem that for the great majority of steam plants, better returns (financially) would result from natural draft produced by means of, not any chimney, but by means of a chimney or chimneys designed especially for each plant."

#### Steam Boiler Economy. By William Kent, A.M., M.E., Associate Editor *Engineering News*. Publishers, John Wiley & Sons, New York, 1901. Price, \$4.

This book, which is a treatise on the theory and practice of fuel economy in the operation of steam boilers, is one which is calculated to bring up the superficial reader of such subjects with a round turn. Mr. Kent has had a wide experience in boiler tests, and has been a critically observant student of the practice and the theory of his subject, and has carefully compared the results of his own findings with those of other workers in the same field.

This work, of 452 octavo pages, contains 17 chapters, with an index, so that reference to subjects is made easy. It is written so that each paragraph begins with the words, in heavy type, which indicate the matter with which each deals, and the book is throughout illustrated with numerous fine engravings.

The first chapter deals with principles and definitions. The author believes that smoke once formed may yet be burned, and has proved his opinion to be correct by thoroughly burning smoke, by passing it up the central draft tube of a Rochester coal oil lamp. He next deals with fuel and combustion, and shows the enormous loss which results from burning coal only to form carbon monoxide. The heating value of carbon burned fully to carbonic acid gas or carbon dioxide is 14,600 British thermal units, while the incomplete combustion which produces carbon monoxide only reaches 4450 British thermal units—a loss of 10,500 thermal units. We may here mention that sometimes this loss may be actually made apparent. If the products of incomplete combustion pass up rapidly through a hot chimney and reach the air at a sufficiently high temperature, they will often burst into dark red flame, as CO burns to CO<sub>2</sub> at the top of the chimney.

In the chapter on coal, it is stated that the amount mined in the United States during 1880 was about 65,757,140 gross tons, while in 1899 it was 252,115,387 tons, representing a value of \$276,147,056. Following this is a chapter of 32 pages on the coal fields of the United States. This is practically an essay on the location of the coal seams in each State or district, together with analyses of the different kinds of coal which each section of the country produces. It is most complete, and is illustrated with maps of the coal bearing areas. The author has a firm conviction that the quality of the fuel used has a most important relation to the economy of the boiler under which it is burned. Following, in logical order, come the results of tests of the heating value of American and foreign coals. Among other things he deals with the calorific power of weathered coals and quotes from Messrs. Hale and Williams to show that, from a series of tests made by those gentlemen, weathering decreases by about 2 per cent. the theoretical calorific power as calculated by Dulong's formula, and that weathering decreases by about one-half of 1 per cent.

the actual calorific power of the coal by three results obtained with the particular apparatus they used. This is probably much less than many would have expected. Fuels other than coal are dealt with, and furnaces and methods of firing lead to a description of the Argand steam blower and various forms of mechanical stokers.

The chapter on steam boiler economy brings out strongly the value of effective heating surface. A long boiler may have plenty of heating surface, but a good deal of it may not be really effective. In this connection it may be mentioned that our English cousins, being compelled by the limitations of the load gauge to keep the size of their locomotive boilers down, do not generally rush to length for increased heating surface. This is shown by Mr. Drumond's recent cross water tubes placed in the fire box just below the crown sheet, which, it is said, have materially increased the steam producing capacity of his boilers.

Mr. Kent gives us two chapters on heating surface; one appeals to the practical man, and the other, full of mathematical formulæ, will interest those who have a taste for working out their deductions on a slate. The "types of steam boilers" is practically a *résumé* or description of the various kinds of boilers used in this country. Under boiler horse power, that somewhat ambiguous method of rating or describing a boiler, not by what it does, but by what it is supposed to do under definite conditions, is explained. That the method is somewhat arbitrary is apparent from the fact that it is never applied to locomotive or marine practice.

When we come to "points" of a good boiler we receive many practical hints on what to insist on and what to reject, and this is really continued under the head of "Boiler Troubles and Boiler Users' Complaints." It is here that boiler explosions come in for examination, and in dealing with this branch of the subject there is no trace of the "mystery" which is often supposed to surround these unfortunate occurrences. The supreme importance of careful and conscientious inspection of material and workmanship is insisted upon. The old familiar bugaboo, the "spheroidal theory," has been ignored, and bad design, poor work, wretched maintenance and careless operation are made to stand up and receive the sentence of the court. The lap joint in horizontal seams, with its hidden and deadly menace to safety, is fully revealed, and its insidious character, baffling alike external and internal inspection, is set forth in words of absolute truth. The only rational practice, the use of the butt joints with welts or straps, is explained and illustrated. The object of evaporation tests is discussed, and the 1899 code of rules, framed by the American Society of Mechanical Engineers, for conducting boiler trials, is given, with numerous tables and many appendices. This is followed by the results of steam boiler trials. A chapter, full of tables and general data, succeeds this, which deals with the properties of steam and water, factors of evaporation and some observations on chimneys.

The book concludes with some miscellaneous remarks on economizers and other related matters, and illustrates some apparatus for indicating furnace conditions, &c. The losses occasioned, due to keeping up steam in idle boilers, might well be pondered by railway men who side track way freight trains on long crossing orders, or who have prolonged "lay overs" at terminals. Observations on the probable boiler types of the future and furnace types of the future close a work that is replete with information, statistics, tables, tests, theoretical considerations, facts and practical hints, which the serious worker in the field of boiler design, building and operation cannot presume to ignore.

**The Directory of Directors.**—The Directory of Directors of 1902, just out, is a volume containing 994 pages, 110 pages more than the Directory for 1901.

It contains an alphabetical list of directors or trustees with New York City addresses, followed by the names of the companies with which each is connected. There is an appendix consisting of selected lists of corporations in banking, insurance, transportation and other lines of business, alphabetically arranged, to-

gether with the names of companies' principal officers and all their directors and trustees. The Directory is published by the Audit Company of New York.

**Dipping, Burnishing, Lacquering and Bronzing Brass Ware.** By William Norman Brown. Publishers, D. Van Nostrand Company, New York, 1900. Price, \$1.

The object of this practical little hand book is to reach the local gas fitter, decorator or general "hand man" of the metal trade, in small country towns, and to give him a few good practical hints, so that he may himself be able to do the work offered, and not be compelled to "send it up to London" every time.

Mr. Brown enumerates the articles necessary to constitute the outfit for doing the kind of work he describes, and has an eye to utility and first cost in what he advises. Having been for a considerable time in a London brass finishing shop, he speaks from personal experience. He speaks directly and plainly to the local artisan, much as a shop foreman might instruct his men. For that reason, probably, Mr. Brown does not supply his readers with definitions. This is, perhaps, to be regretted, because when the observations of a skilled worker take the permanent form of a published work it is likely to reach a wider circle of less technical readers than the author may first have anticipated.

Chapter I deals with cleaning and dipping into acid, and "pickle." Chapter II, scratch brushing, burnishing and polishing. Chapter III takes up the subject of lacquering, and enumerates the tools, describes the process, and gives the methods of making lacquers, for the benefit of those who cannot readily obtain them, or who prefer to make their own. In Chapter IV, under the head of bronzing, the process of applying and the composition of black bronzing, Florentine red bronzing and green bronzing are described. A small index is appended.

The book is eminently practical, and contains many useful shop "kinks." The reader may feel very certain that good work has actually been done in the way and with the materials described. The book is also published in London.

**The Marinette Iron Works Mfg. Company's New Plant.**—The Marinette Iron Works Mfg. Company, Marinette, Wis., have selected 6 acres of choice land adjoining the city of Warren, Pa., where a manufacturing plant will be laid out. The buildings to be erected will be of brick and steel. The dimensions will be as follows: Machine shop, 80 x 350 feet; foundry, 80 x 250 feet, and other buildings, including the blacksmith shop, pattern shop and pattern storage, will be in proportion. The various departments will be equipped electrically, the power to be supplied by gas engines manufactured at the Marinette works, which will be directly connected to the generators. The new works, with a large working force, will enable the company to turn out three times the orders they are now able to fill. The company feel justified in making the move because of the popularity of the engines adapted to all kinds of power service. They report business very active and have now under construction three orders for export, while they are four months behind on domestic orders, with further important contracts in sight. They are somewhat hampered by the difficulty in obtaining skilled help, and could now utilize the services of 20 more machinists were they obtainable.

The H. W. Caldwell & Son Company of Chicago have recently purchased the entire equipment of gear patterns, molding machinery, gear cutters and all other appliances pertaining to the power transmission business of the Walker Mfg. Company of Cleveland, Ohio. The Caldwell Company state that they are prepared to furnish gears from the Walker patterns promptly, and that they will maintain the high standard established for these gears by the Walker Company.

The Buffalo Steel Company of Tonawanda, N. Y., are now rolling light section T-rails of 8, 12, 16 and 20 pounds per yard.



# The Iron Age

New York, Thursday, May 8, 1902.

DAVID WILLIAMS COMPANY,	-	-	-	-	-	-	PUBLISHERS.
CHARLES KIRCHHOFF,	-	-	-	-	-	-	EDITOR.
GEO. W. COPE,	-	-	-	-	-	-	ASSOCIATE EDITOR.
RICHARD R. WILLIAMS,	-	-	-	-	-	-	HARDWARE EDITOR.
JOHN S. KING,	-	-	-	-	-	-	BUSINESS MANAGER.

George W. Cope, associate editor of *The Iron Age*, and for many years at the head of the Western editorial office at Chicago, has been called to the main editorial office at New York.

W. T. Partridge, an experienced journalist, has been placed in charge of the Western editorial department.

### Seven Months of Extraordinary Activity.

It is now about seven months since the iron trade began to develop the extraordinary activity which has broken all records for volume of business. Prior to that time no indication had been shown of an approaching tidal wave of heavy buying. On the contrary, not a few of the most experienced members of the trade had formed the opinion that the crest of the wave of prosperity had passed, and that a gradually declining demand and a lowering of prices were to be expected. They were fortified in their opinion by a number of conditions which seemed to them conclusive. Prominent among them was the partial failure of the corn crop, the main reliance of a great section of the country. Again, important additions to the producing capacity of iron and steel works had been made during the summer and autumn of 1901, and it was a serious question whether a market could be found for the increased product without disturbing values. Further, European countries were suffering from the collapse of their commercial and industrial activities and European manufacturers had again become keen competitors for international trade, to the great detriment of our export business. We had grown to regard the export trade in iron and steel products as a permanency, and the prospect of its curtailment caused serious misgivings. We had also been educated to the export trade as a profit yielding adventure, owing to the protracted prevalence of higher prices abroad than at home, and the outlook in this direction was thus doubly disquieting.

But the unexpected happened. Instead of a heavily reduced movement of merchandise to the afflicted agricultural districts of the West, it was found that the people of even the worst drought-ridden sections were apparently as freely buying luxuries and necessities as though they had enjoyed a bountiful crop. Their accumulations in previous years of abundance easily enabled them to endure one season's failure. Railroads continued to report increased earnings in these as well as all other sections of the country. After the bogey of crop failure had been thus effectively driven off, it seems as though business interests generally must have acquired a fresh stock of courage. The demonstration of the substantiality of the prosperity of the country was certainly most convincing. From that time the demand for iron and steel products grew as it had never grown before. In an amazingly short period, it will be remembered, the fairly large stocks of pig iron disappeared. When new blast furnaces were blown in or idle stacks were started their product was so easily absorbed as to surprise the entire trade. Contracts for all kinds of materials were freely placed for delivery far into the future. All classes of consumers bought as

freely and in such large volume that in every branch of the iron and steel trade manufacturing establishments oversold their capacity, and have ever since been in trouble with their customers because of unsatisfactory deliveries. Instead of the decline in the export trade depressing the market, we have been obliged to go abroad to purchase additional quantities of iron and steel. The whole development of these seven months has thus been most surprising.

The most extraordinary feature of this remarkable period, however, is the fact that notwithstanding the enormous volume of business, surpassing anything previously known, and the marvelous demand which at times caused decided scarcity, the usual accompaniment of a boom has been absent. Prices were maintained on a reasonable basis notwithstanding the temptation to advance them. On previous occasions of this character we have seen prices enhanced beyond all reason, even with less encouragement than that afforded during this period. It would have been an easy matter to have put the price of steel rails several dollars higher, as well as the prices of Bessemer pig iron, steel billets, structural steel and other iron and steel products. That prices have not been unduly advanced may be placed to the credit of the great manufacturing corporations, who have done everything in their power to maintain values at a reasonable level in order to continue to encourage consumption. A remarkable concert of movement obtained among these large manufacturers, even though engaged in dissimilar lines. The lessons of the past were borne in mind when it was determined that so far as they could prevent them no wild advances should be made which would inevitably be followed by a reduced consumption and a considerable slump in prices. We thus see that at the present time, although the producing resources of this country are so overtaxed that it is necessary to import considerable quantities of materials from abroad, the great business of the country is being conducted on the basis of reasonable prices. It is true that some consumers, and possibly a considerable percentage of them, have not been able to cover their requirements, and these are now compelled to pay premiums above the regular or official price to secure the early delivery of such materials as they require. Nevertheless, the large manufacturers continue to exert their utmost influence to supply the trade as far as possible and to prevent an undue expansion in price. It is certainly a most remarkable exhibition of restraint to see these manufacturers avoid the opportunity which might enable them to secure much greater profits.

Some speculation exists as to what the effect on the trade may be of a general revision of prices, which some think must be inevitable by the close of this year, after many contracts taken at comparatively low prices have expired. It is assumed that the price of foundry pig iron, for instance, may be advanced as much as 50 per cent. above the rate ruling on contracts running through the greater part of the current year. Those who take this view of the situation are inclined to the belief that such an advance in cost will greatly diminish the consumption of pig iron, as it will so seriously increase the cost of all articles into which pig iron enters. It remains to be seen, however, whether by that time the conditions which now exist may not be changed. It is almost inconceivable that the high pressure for materials should continue beyond the present year. It is more rational to suppose that by that time the high tide of business will have diminished to such an extent that our manufacturers will be able to take care of the consuming interests and that reasonable views with regard to prices can be maintained.



### The Anti-Injunction Bill.

"He laughs best who laughs last" seems to be applicable to the present status of the anti-injunction bill now in Congress. The action of the National Manufacturers' Association at Indianapolis recently against the bill, in conjunction with the protests received from other business organizations, seem to have been very effective, as the Senate has grown cold, and even the ardor of the House has received a serious shock. The flood tide of approval proceeding from labor organizations which swept over Congress during the winter has turned, and the ebb tide now is running full and strong.

The ambiguous character of the bill makes it liable to all sorts of legal quibbling, and to manufacturers especially it seems to propose legislation which would give exceptional privileges to workingmen; privileges in labor controversies not to be enjoyed by other than labor organizations or by other individuals.

According to the statements of labor advocates, the object sought to be attained by the act is primarily to prohibit the punishment of combinations organized to do, or doing, acts that would be lawful if done by an individual, and to prohibit the exercise of injunctions to restrain the doing of such acts by any combination, provided that such acts are not intended to and do not injure persons or property.

But the language of the bill does not convey this impression, and Judge Ray, who presented the majority report concerning the bill to Congress, has stated: "It will permit men in large bodies, in the employ of companies doing an interstate business, to combine or agree to quit work when by such action they do not knowingly endanger or destroy life or property."

Evidently the combining or agreeing to quit work, in the mind of the framers of the bill, implies the power to quit work without being subject to injunction. Otherwise the act would be barren, but the bill fails to make this point explicit. Yet, even admitting that men are authorized to quit work in large bodies, the interpretation of the words "knowingly endanger" is the real question of importance, and it is scarcely conceivable how a large body of men can simultaneously quit work with the purpose of coercing an employer, without having knowledge that the employer's interests will suffer in some way, and indirectly, if not directly, his property be subjected to loss. And if some such result was not intended, what would be the object of concerted action in quitting work?

The language of the bill would seem to give to labor organizations dangerous liberties, and if so, manufacturers' protests are well grounded. The contradiction of the avowed object of the bill by its apparent purpose is enough to condemn the proposed act, and such seems to be the prevalent opinion in Congress.

Iron molders at Toledo, to the number of about 200, went on strike April 30, demanding a 10 per cent. increase or a minimum of \$2.50 per day. The shops affected are those of the Toledo Plow Works, Vulcan Foundry, Baker Brothers, National Supply Company, Harris Toy Company, Merrell Mfg. Company, H. B. Milmine & Co. and Donovan Wire & Iron Works.

The annual convention of the Tin Plate Workers' International Protective Association gathered in New Castle, Pa., on Tuesday, May 6. The American Tin Plate Company have offered to sign the tin house workers' scale for the year, beginning July 15, 1902, on the same basis as at present. It is probable that this proposition will be accepted.

### Pittsburgh Foundrymen's Association.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the rooms of the Engineers' Society in that city on Monday evening, May 5. There was a large attendance, and the meeting was one of the most interesting held for some time. Among those present were Charles Bailey, Reliance Steel Casting Company; A. W. Slocum, Pennsylvania Car Wheel Company; S. H. Stupakoff; S. W. Hay, Whiting Foundry & Equipment Company; J. S. McCormick, McCormick Company; J. C. Frohman, S. Obermayer Company; E. A. Kebler, Mathew Addy & Co.; S. D. Sleeth, Westinghouse Air Brake Company; John McLaren, Phillips & McLaren; D. P. Thomas, Sterritt & Thomas; William Yagle, William Yagle & Co., Limited; J. S. Seaman, Seaman-Sleeth Company; A. O. Backert, the *Iron Trade Review*, and Robert A. Walker, *The Iron Age*. In addition to the above there were about 15 other visitors, some of them from the various manual training schools in Pittsburgh and Allegheny, including a representative from the Schwab Manual Training School of Homestead. Prof. C. D. Connelly, superintendent of manual training schools in Allegheny, was present by request, and gave a lecture on "Industrial Training in Public Schools," illustrated by lantern slides. Then followed a paper by Edward B. Gilmour, Milwaukee, Wis., on "The Relative Position of Employer and Employed."

### Engine Builders' Association of the United States.

The fourth annual convention of the Engine Builders' Association of the United States will be held in the Hotel Schenley, Pittsburgh, on May 22 and 23. The following is the programme of the convention: Thursday, May 22, welcoming address, by President W. M. Taylor, followed by papers on "Engine Forgings," by H. F. J. Porter of New York; "Engine Requirements for the Parallel Operation of Alternators," by E. M. Tingley of Pittsburgh; "Piping Materials for Steam Plants," by John B. Berryman of Chicago, and "The Requirements for the Paralleling of Alternators as Viewed by the Engine Builders," by H. M. Longwell of Pittsburgh.

The sessions will be followed by a dinner at the Hotel Schenley on Friday, May 23, at 8 p.m. G. N. McBrier of Erie, Pa., is secretary of the association.

### The H. Adler Company.

The H. Adler Company, Pittsburgh, manufacturers of gas and gasoline stoves and ranges, have bought a site of 4 acres of land at Carnegie, Pa., near Pittsburgh, on which they will build a modern plant for the manufacture of their goods. There will be seven buildings, which will cost, with equipment, about \$75,000. These will be a foundry, 70 x 150 feet; a mounting room, 40 x 200 feet; a finishing room, 30 x 120 feet; a store and stock room, 50 x 200 feet; an enameling room, 50 x 100 feet; a press room, 30 x 100 feet, and an engine house. The press room will be of brick and steel construction, two stories high, and will contain the offices of the company. The other buildings will be one-story structures and will be iron clad. A gas engine of 100 horse-power is to furnish power. The work of excavating will begin May 15 and the company expect to take possession on December 1. The present quarters at 241 First avenue, Pittsburgh, will be retained as the main offices and for a warehouse. The H. Adler Company have been very much cramped for room for some time, having enjoyed a very large trade in their line of gas appliances, and it became absolutely necessary for the firm to greatly enlarge facilities for the manufacture of their goods.

The American Bridge Company have refused the demand of the Structural Iron Workers' Union for 50 cents an hour and an eight-hour day. The company have made a counter proposition, to pay 47½ cents per hour for an eight-hour day. A vote will be taken on this proposition by the men this week.

### The Tennessee Coal, Iron & Railroad Company.

Don H. Bacon, chairman of the Tennessee Coal, Iron & Railroad Company, has issued the following report, under date of May 6, to the stockholders:

At the close of the year 1900 the floating indebtedness of this company amounted to \$4,120,000, of which \$920,000 was for account of current business, the balance of \$3,200,000 representing borrowed money and overdue accounts. Your Board of Directors decided to issue a general mortgage for \$15,000,000: \$10,653,500 to be used for retiring bonds then outstanding as they fell due, \$3,000,000 to be sold and the floating liabilities reduced, \$1,346,500 to be sold and the proceeds expended for additions and betterments.

Up to this date, April 17, 1902, it has been necessary to market only \$3,000,000 of bonds, the money received for them reducing floating obligations, the balance required (except \$100,000 still due) having been taken from earnings. All bills are now met promptly or anticipated, and discounts secured. During 1901 for construction and improvements the sum of \$759,000 was expended, and the company have or will soon have under way, at their mines, furnaces and mills, additions and improvements costing the aggregate sum of \$1,020,000. Further important additions have practically been decided upon.

Under the system of accounting that was followed prior to 1901, we believe that to real estate or plants were charged many items that should have been charged to cost, thus increasing the book value of your property and the profits shown, and reducing the apparent cost of output. The method now followed is believed to be conservative. Had the market price of pig iron during 1900 continued through 1901 the net earnings of the company would have been \$1,704,228.24 greater than now shown. An examination showed that many of the plants for manufacturing and the equipment at others were overvalued and that accounts receivable included large sums that were in no sense receivable. In the readjustment, plants, investments, accounts and bills receivable were reduced by the sum of \$6,424,000.

This company hold in fee large quantities of iron ore and coking coal, estimated as sufficient to supply our present furnaces 60 years and so located as to insure cheap delivery.

The iron mines are being put in order to make a large output at a reduced cost, and the coal mines are receiving some attention.

In the construction of your steel mill several new and untried devices were introduced. Their removal and the substitution of others has been costly, both in time and money. The output, which is now about 14,000 tons per month, will be increased.

Your directors recommend that the net earnings be used to improve or replace your different plants, making them conform more closely to the best ones of like character.

The following is the general financial statement:

Gross earnings from operations for the year were as follows:	
Profits from mining and manufacturing .....	\$1,640,104.94
Rents .....	76,661.69
Miscellaneous .....	7,371.27
Total .....	\$1,724,137.90
Deduct, interest on bonds and floating debt, interest and dividends on guaranteed securities and other charges, amounting to.....	862,189.39
Net earnings from operation.....	\$861,948.51
Add other income.....	1,500.00
	\$863,448.51
There were set aside out of earnings the following sums:	
For royalty on ore and coal removed from fee lands.....	\$359,234.04
For additions to reserve and insurance funds.....	151,094.18
Making a total thus set aside of.....	510,328.22
	\$353,120.29
There was written off from the valuation of inventory accounts for depreciation.....	89,447.00
	\$263,673.29
Dividends on the preferred stock of the company, amounting to 8 per cent., were paid.....	19,864.00
Leaving a balance of.....	\$243,809.29

Which sum was used to reduce the valuation of plant account.

The condensed balance sheet is as follows:

Resources.	
Land .....	\$26,245,875.56
Plant account.....	8,012,800.12
Investments .....	392,470.72
Treasury securities.....	8,000.00
Cash, bills and accounts receivable.	2,181,993.01
Inventory accounts.....	1,385,603.66
Total resources.....	\$38,226,743.07
Liabilities.	
Capital stock:	
Common, T. C., I. & R. R. Company .....	\$22,552,800.00
Preferred, T. C., I. & R. R. Company .....	248,300.00
Guaranteed, A. S. & S. B. Company, preferred.....	440,000.00
Bonds (less Sinking Funds).....	13,285,035.94
Current liabilities.....	1,469,158.64
Reserve and provisional funds....	231,448.49
Total liabilities.....	\$38,226,743.07
During the year 1901:	
Quick convertible assets have increased.....	\$374,668.98
Current liabilities have decreased.....	2,653,003.99
Inventory accounts have been reduced.....	386,912.49
There was expended during the year for new construction:	
At Ensley Steel Works.....	\$636,404.92
At Pratt Mines.....	46,370.16
At Bessemer Rolling Mill.....	12,670.79
At other plants.....	64,207.84
Total .....	\$759,653.71

The production and shipments for 1901 were:

	Tons.
Coal:	
Total product.....	4,085,086
Shipments to market.....	1,672,814
Converted into coke.....	1,969,005
Consumed in operations.....	441,875
Coke:	
Total product.....	1,179,855
Shipments to market.....	22,899
Shipments to departments.....	1,155,904
Iron Ore:	
Red ore.....	1,113,362
Brown ore.....	302,361
Total product.....	1,415,723
Shipments to departments.....	1,415,723
Limestone:	
Total product.....	220,569
Shipments to market.....	820
Shipments to departments.....	218,805
Pig Iron and Ferromanganese:	
Total product.....	628,268
Shipments to market.....	572,435
Shipments to departments.....	102,580
Open Hearth Steel Ingots:	
Total product.....	109,805
Shipments to departments.....	108,260
Open Hearth Steel Billets, Blooms and Slabs:	
Total product.....	94,566
Shipments to market.....	81,205
Shipments to departments.....	13,905
Iron and Steel Bars, Plates and Sheets:	
Total product.....	23,026
Shipments to market.....	20,475
Shipments to departments.....	3,024

#### Summary of Market Sales.

	Tons.
Pig iron and ferromanganese.....	572,435
Coal .....	1,672,814
Steel billets, blooms and slabs.....	81,205
Iron and steel bars, plates and sheets.....	20,475
Coke .....	22,899
Limestone .....	820
Total .....	2,370,648

John McMahon, president of the Blast Furnace and Smelter Workers' National Association, has sent the wage demand of the association to the blast furnace operators of the Pittsburgh district, the Mahoning and Shenango valleys and the Cleveland district. The proposition is for the establishment of an eight instead of a 12-hour day the first of next month, with the same wages as are now paid for 12 hours.

The employees of the Huntington Works of the American Car & Foundry Company, at Huntington, W. Va., have been granted a voluntary increase in wages ranging from 10 to 20 per cent.



## MANUFACTURING.

### Iron and Steel.

The Marietta Sheet & Tin Plate Company of Marietta, Ohio, have awarded the contract for the erection of their sheet mills to the Wheeling Mold & Foundry Company of Wheeling, W. Va. The contract calls for four hot and four cold mills and six shears. At a meeting of the company held at Marietta last week, the following officers were elected: President, J. M. Ickes; secretary, L. C. Taylor; treasurer, R. Park; superintendent, D. Lewis, and engineer, E. E. Erikson of Pittsburgh.

The American Sheet Steel Company have placed an order with the Bass Foundry & Machine Company of Fort Wayne, Ind., for a 30 x 48 heavy duty rolling mill engine for their plant at McKeesport, Pa. The Bass Company are also building a cross compound condensing Corliss engine for the Laughlin Works of the American Tin Plate Company, at Martin's Ferry, Ohio.

Work has been begun to prepare the site for the building of the plant of the Jupiter Steel & Tool Company at Ballard, Wash., on Puget Sound. The company were organized by the Pacific States Development Company. The work of construction is to begin about July 1. At the outstart there will be put up two open hearth furnaces, a complete foundry outfit and power plant. Special machinery will be constructed for turning out the Bewsher dredging pumps for the General Construction Company of Seattle. The main office of the Jupiter Steel & Tool Company is at Seattle, with an Eastern office at the Lewis Building, Pittsburgh, Pa.

The Franklin Rolling Mill Company, being organized at Franklin, Pa., and who will absorb the Electric Tripartite Steel Pole Company of New York City, will begin the construction of a new plant at once. The company will be capitalized at \$800,000.

The Alleghany Ore & Iron Company, Clifton Forge, Va., have purchased the iron ore mines at Oriskany and Alleghany Furnace at Iron Gate, Va., and commenced to operate them April 1. The property was formerly leased by the Alleghany Iron & Steel Company. The company have also purchased Gem Furnace at Shenandoah, Va., which they have extensively repaired and will put in blast about the middle of May. This furnace was formerly owned by the Empire Steel & Iron Company.

The Empire Iron & Steel Company, a new corporation, who are building a sheet mill plant at Niles, Ohio, have let the following contracts: Roll train for sheet mills, to the Globe Foundry & Machine Company of Niles, Ohio; traveling crane, to the Case Mfg. Company, Columbus, Ohio; main buildings, to American Bridge Company; boilers, to the Stirling Company, Barberton, Ohio; electric plant, to the Akron Electrical Mfg. Company, Akron, Ohio, the generator to be connected to a Brownell engine.

Most of the buildings for the new skelp and pipe mills being built by the Sharon Steel Company, at Sharon, Pa., have been erected and a considerable portion of the machinery is installed. The Sharon Steel Company have a great deal of new construction under way, consisting of Otto-Hoffman coke ovens, four additional 50-ton open hearth furnaces, sheet mills and two new blast furnaces. Work on this new erection is being pushed as fast as possible, but considerable delay has been experienced on account of scarcity of structural material.

The city of Moline, Ill., is jubilant over the prospects of the building of a blast furnace having a capacity of 200 tons per day and which will employ upward of 200 men. The East Moline Company have given an option on a large tract of land in East Moline to W. J. Ingram, who is connected with the Waukon Iron mines in Iowa.

The S. Severance Mfg. Company of McKeesport, Pa., have applied for a charter with a capital of \$50,000. They will take over the plant of S. Severance, manufacturer of spikes, at Glassport, Pa. George W. Whitney, S. Severance, Jr., and Frank W. Severance are prominently identified with the company.

A report has gained currency that the Great Western Tin Plate Works of the American Tin Plate Company, at Joliet, Ill., which have been idle for some time, are about to resume work. The capacity of the plant is to be increased by the addition of new machinery.

The basic open hearth plant of the Sharon Steel Company, at Sharon, Pa., turned out in April 18,806 tons of steel, the largest output in any one month since this works was started. In one day the output was 971 tons. Four more 50-ton furnaces are being added to this plant.

The National Tube Company of Pittsburgh have secured from David Heggie of McKeesport, Pa., patent right to a new form of roll for the manufacture of pipe couplings and similar articles.

W. E. Taylor of Youngstown, Ohio, advises us that he is not at present interested in the building of a steel plant at Youngstown or any other location. Newspaper reports have connected Mr. Taylor with various steel enterprises, but these have no foundation in fact.

Soho Furnace, Jones & Laughlins, Limited, at Pittsburgh.

will be blown out in a short time for extensive repairs. The stack will be relined and a skip hoist added. The capacity of the stack will also be slightly increased and it is expected to turn out about 400 tons a day when the improvements have been finished.

The new steel car wheel plant to be built by C. T. Schoen and others in the Pittsburgh district will not be actively started for some months yet and may possibly not be built until next year. The reason given for this is that a good deal of special machinery is required for making car wheels by Mr. Schoen's process, and experiments are now being carried on, and until the absolute success of these is demonstrated active work on the new plant will not be started. In the meantime the testing of the new steel wheels made by this process is going on in a quiet way on several of the main trunk lines.

The Titusville Iron Company, Titusville, Pa., will build an addition to their plant 211 x 400 feet.

The Rome Furnace Company, Chattanooga, Tenn., have just blown in their Rome Furnace.

The Berger Mfg. Company of Canton, Ohio, manufacturers of metal roofing, have decided to erect an addition to their plant. The improvements provide for an addition to the cutting and painting department and a new blacksmith shop.

It is reported that the Pequest Furnace, Oxford, N. J., will be blown in the current week.

### General Machinery.

In 1900 the Dayton Globe Iron Works Company, Dayton, Ohio, manufacturers of complete water power installations and power transmission machinery, received an order from the Royal Aluminum Company for two pairs of wheels for their new plant at Shawinigan Falls, each pair guaranteed to develop 3200 horse-power under a head of 125 feet. The same firm have recently been awarded a contract to be in every way a duplicate of the other two wheels furnished, making three pairs of wheels in their power house, aggregating 9600 horse-power.

H. C. Torrance, manager of the Pittsburgh office of the Brown Hoisting Machinery Company, Frick Building, Pittsburgh, has received a contract for installing the latest improved Brown type of ore handling machinery at the three new blast furnaces of the St. Clair Furnace Company, at Clairton, Pa.

A boring mill, lathe, shaper and drill press will be required by the Grays Harbor Iron Works, Hoquiam, Wash., who will erect a new plant consisting of a machine shop, 40 x 80 feet, two stories; foundry, 50 x 56 feet, and blacksmith shop, 36 x 50 feet. The cupola has been purchased from the S. Obermayer Company of Chicago. The company recently reorganized with the following officers: W. G. Cullen, president; E. W. Karr, secretary and manager, and John Allman, treasurer.

The H. H. Mayhew Company, Shelburne Falls, Mass., manufacturers of mechanics' tools, will soon add some special machinery. A 30 x 70 foot addition to the plant is nearly completed, and a Rodney Hunt horizontal wheel of 250 horse-power, and Dalrymple steel penstock have been installed. These improvements will increase the capacity of the plant 25 per cent.

J. D. Fate & Co., Plymouth, Ohio, manufacturers of clay working machinery, have incorporated under the name of the J. D. Fate Company. The new company will enlarge the present plant.

N. Bosch and J. C. De Bruyn, proprietors of the Valley City Machine Works, Grand Rapids, Mich., are about to build a one-story machine shop, equipped with steam power, at Grand Rapids. The outlay will be about \$8000. Plans are completed and are now in the hands of contractors.

The Conrey Placer Mining Company, Ruby, Mont., are now purchasing the equipment for their new machine shop, 30 x 100 feet, the erection of which will be started shortly.

The Globe Steel Range Company, Kokomo, Ind., have started up their entire plant, the engine room, mounting room, pattern shop and fire proof pattern vault having been completely rebuilt. New equipment purchased includes a gas engine from Foos Gas Engine Company, Springfield, Ohio; large power gap shear from Toledo Tool & Machine Company, Toledo, Ohio; 250-light dynamo from Triumph Electric Company, Cincinnati, Ohio; line shafting, hangers, &c., from Ford & Donnelly, Kokomo, Ind.; pulleys from Reeves Pulley Company, Columbus, Ind., and belting, &c., from Charles A. Schieren & Co., Chicago.

Orders recently booked by the American Blower Company of Detroit, Mich., include apparatus for installation in the following buildings: Custom House and Post Office, San Francisco, Cal.; Queen's University, Kingston, Ont.; Buhl Club House, Sharon, Pa.; Walker School, Flint, Mich.; Pingree School, Detroit, Mich. They have also received an order from the Ohio Leather Company for a heating and drying system for their new plant at Girard, Ohio.

M. D. Taylor and E. W. Lowell of Janesville, Wis., have organized the Taylor & Lowell Mfg. Company, and have taken a lease of the Kent Corn Planter Building for two years, where they will manufacture Taylor's patent woven wire fence machines and other special machinery.

A quantity of new machinery will be required by the Champion Iron Fence Company of Kenton, Ohio, for their new plant.



They advise us that they are having plans prepared for rebuilding their plant, which was recently destroyed by fire, and as soon as a site is obtained and the plans and specifications completed, building operations will be commenced. The new plant will be much larger and better equipped than the old one.

The Mutual Machine Company, Washington, N. C., recently incorporated, will erect a modern machine shop for general repair work. All equipment has been purchased. The officers are J. Havens, president; J. M. Russell, secretary, and W. P. Bangham, treasurer.

The Ingersoll-Sergeant Drill Company of New York City, manufacturers of compressors, rock drills and coal cutters, have opened offices in Room 1212, Park Building, Pittsburgh, in charge of Conrad Bollinger, Jr.

The Standard Diamond Drill Company of Chicago have been organized with a capital stock of \$50,000 for the purpose of manufacturing drills and machinery. The incorporators are Byron B. Carter, Charles S. Bargolf and E. B. Stephens.

The Wiltse Mfg. Company of Chicago have been organized with a capital stock of \$50,000 for the purpose of manufacturing machinery. The incorporators are C. J. Wiltse, W. J. Gardner and W. J. Balls.

The Minnesota Steel & Machinery Company have been incorporated with a capital stock of \$500,000. The new company are a consolidation of the Twin City Iron Works, Minnesota Iron Works and Barrett & Record, all of whom had plants in South Minneapolis. The incorporators of the company are James L. Record, Otis P. Briggs, Joseph Garbett, R. P. Gillette and A. C. Cobb.

The Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., have made an agreement with the Lorain Steel Company, whereby the Westinghouse Company have acquired the electric railway equipment business of the Lorain Company, formerly carried on under the name of the Steel Motor Company, at Johnstown, Pa. The Westinghouse Company will still continue to maintain the works at Johnstown, and sell the steel motor as an adjunct to their own electric railway business.

The Kohler Die & Specialty Company, Chicago, have been organized with a capital of \$10,000 to manufacture dies, tools, &c. The incorporators are H. A. Kohler, E. C. Kohler and B. E. Sherman.

The Hoeflinghoff & Laue Foundry Company, Cincinnati, Ohio, have installed a new 15-ton, 50-foot span, 3-motor electric traveling crane, manufactured by Northern Engineering Works, Detroit, Mich.

The Wheeling Mold & Foundry Company, who recently completed a large plant at Wheeling, W. Va., for the building of rolls and rolling mill machinery, have received a contract for the sheet and tin plate mills for a new plant to be erected at Marietta, Ohio. They also have a contract for a large amount of tin plate machinery for the new works of the McKeesport Mfg. Company, at Port Vue, McKeesport, Pa. The Wheeling Mold & Foundry Company will double their capacity for making chilled rolls, having a great many orders for these on hand.

The United Engineering & Foundry Company of Pittsburgh have made a heavy shipment of rolling mill machinery to the Colorado Fuel & Iron Company, at Pueblo, Col., consisting of three 10-inch rod mills and one 14-inch rod mill, from their Lloyd-Booth Works, at Youngstown, Ohio.

The Brown & Zortman Machinery Company of Pittsburgh have received a contract for the punching and shearing machinery, cold saws, rotary planers, &c., for the new structural fitting shop of the West Virginia Bridge & Construction Company of Wheeling, W. Va. The same firm have received an order for a large lot of tools for the plant of the Oil Well Supply Company of Oil City, Pa.

The Brower-Warner Company, Chicago, have been incorporated with a capital stock of \$28,000, for the purpose of manufacturing machinery. The incorporators are N. H. Hacker, Myles O. Kelley and George E. Ruther.

The new plant to be erected by the recently organized Coshocton Tool Company of Coshocton, Ohio, will be located on the Wheeling Railroad tracks and will consist of three buildings for the present, a machine shop 100 x 60 feet, foundry 60 x 60 feet, and office and pattern shop, two stories, 36 x 45 feet. The factory will be placed in operation about July 1. The Coshocton Board of Trade will lend the company \$10,000 without interest to assist in the building of the plant; a site was also donated. Punching and shearing tools and other metal working machinery will be manufactured.

The Mt. Whitney Power Company, Visalia, Cal., are in the market for a pipe line, about 1000 feet long, for about 340 feet of pressure, for 40 cubic feet of water per second; one 750-kw. generator, water wheels and governor, together with step up transformers and equipment for two new substations. The company will build a new power plant about 35 miles east of Visalia on the Kaweah River. This installment will add about 1100 horse-power to their present plant of 1800 horse-power.

The Board of Public Improvements of St. Louis, Mo., have let the contract to T. H. Busey, for \$43,790, for the erection of a machine shop, 60 x 130 feet, and a blacksmith shop, 26 x 57 feet, at high service pumping station No. 1, at Bissells Point.

The Canton Foundry & Machine Company of Canton, Ohio,

have increased their capital stock from \$25,000 to \$100,000, and will make improvements. H. A. Cavnat is president.

The New York Blower Company of Bucyrus, Ohio, are building four 15-foot mechanical draft fans for the new power plant of the Third Avenue Elevated, New York. They are also building eight 9-foot fans for Government installations.

The Pennsylvania Railway Company have commenced work in Columbus, Ohio, on extensive additions to their repair shops. The improvements will cost \$600,000, and include a new round house, coaling station, erecting shop for locomotives, an addition to the machine shop, addition to the paint shop, new boiler shop, new passenger car shop, and a large electrical power plant. All machinery throughout the works will be operated by motors.

A new company, to be known as the Pittsburgh Valve & Fittings Company, have purchased a 70-acre site in Barberton, Ohio, and will erect a large plant for the production of plumbers' fixtures and supplies. W. A. Johnson and O. C. Barber of Barberton and M. J. Alexander and others of Pittsburgh are interested in the new company. It is stated that the plant will comprise eight buildings—five 200 x 40 feet, one 250 x 50 feet, one 106 x 50 feet, and one 450 x 60 feet. The site selected has a frontage of nearly 2400 feet on the Erie Railway tracks. F. O. Weary of Akron is preparing plans for the plant.

The Warren Electric Company of Sandusky, Ohio, have decided on improvements to their plant to cost about \$100,000. They have secured additional building space and now have a site 400 x 165 feet. They will build two new shops and an office building. They will install new engine, boiler, 30-ton traveling crane and a number of new machine tools. The company have recently been organized and E. P. Breckenridge, a wealthy Toledo manufacturer, has taken a half interest. New officers have been elected, as follows: C. C. Warren, president and treasurer; E. P. Breckenridge, vice-president; Frank Warren, secretary, and H. B. Warren, chief engineer.

The Wellman-Seaver-Morgan Engineering Company of Cleveland, Ohio, have increased their capital stock from \$100,000 to \$500,000. They have just placed a contract with the Garry Iron & Steel Company, Cleveland, for the structural work for a new building 300 x 111 feet, as an addition to their plant now under erection.

#### Engines and Boilers.

The five pairs of blowing engines built by the Mesta Machine Company of Pittsburgh for the Illinois Steel Company, at South Chicago, are all now in operation. The Mesta Machine Company have received an order for another engine from the Illinois Steel Company, to go to Joliet. These engines are equipped with a new air valve, patented by the Mesta Company. Other orders recently booked included a 45-inch blooming mill and a pair of 46 x 60 inch reversing engines for the La Belle Iron Works of Steubenville, Ohio; a pair of 50 x 60 inch horizontal reversing engines for the Alan Wood Iron & Steel Company, Conshohocken, Pa.; a 24-inch train of rolls containing a universal mill and a bar mill, for the Colorado Fuel & Iron Company, Denver, Col.; five pairs of steepie type, cross compound blowing engines with 44-inch high pressure and 84-inch low pressure cylinders, and 84-inch air cylinders, with 60-inch stroke, for the Union Steel Company, whose plant is under erection at Donora, Pa.; three steepie type high pressure blowing engines for the Lake Superior Power Company. In addition many roll lathes, shears and other rolling mill equipment are coming through the shop.

The improvements which have been under way at the plant of the Atlas Engine Works, Indianapolis, Ind., are about completed. The increased capacity which the improvements give the works will enable them to supply boilers for immediate shipment, and they expect to be placed in the same position in regard to engines in a few months.

The Keystone Valve & Mfg. Company of Pittsburgh have been granted a charter with a capital of \$100,000. They have opened temporary offices on Carson street, in the South Side, Pittsburgh, and intend to build a plant in that city for the manufacture of a newly designed steam valve.

The Rochester & Eastern Rapid Railway Company of Rochester, N. Y., advise us that it is probable that they will erect their shops and power house at Canadagua. They hope to have the first 8 miles of their road, running from Rochester to Pittsford and Fairport, in operation by August. Power will be gotten temporarily from the Rochester City Railway.

A 50 horse-power engine and an elevator are required by J. E. Rhoades & Sons, Wilmington, Del., manufacturers of leather belting, for their new plant, bids for erection of which are now being received. It will consist of a main building, 50 x 150 feet, three stories, with 45 x 43 foot wing; another building, 45 x 90 feet, one story, and engine and boiler house, 30 x 30 feet. All will be of slow burning construction and will be equipped with sprinkler system.

The Edison Electric Illuminating Company, Topeka, Kan., will build a new engine house, 50 x 120 feet, equipment for which has been purchased. The American Bridge Company will furnish the steel work for the building; the General Electric Company, the generators and switchboard; Buckeye Engine Company, the vertical engines, and the Crane Company of Chicago, the steam piping. The engines will be of 800 horse-power, and generators 500 kw.

The Montpelier Cup & Metal Works, Montpelier, Ind., manufacturers of adjustable engine pumps, valves, valve cups, &c., who incorporated with a capital stock of \$30,000 and succeeded to the business and plant of C. S. Edmonds & Co., early in February, are enlarging the latter by the erection of a foundry building, 50 x 160 feet, with side additions for storage rooms. Equipment, which has been purchased, includes a Whiting cupola and machinery purchased from the Lodge & Shipley Machine Tool Company of Cincinnati, Ohio. The officers are: A. P. Smith, president and general manager; M. J. Smith, secretary, and L. M. Page, treasurer.

The Lima Electric Railway & Light Company, Lima, Ohio, have increased their capital stock from \$500,000 to \$850,000 for the purpose of building a new power house and installing a new steam heating system and other improvements.

#### Foundries.

The A. Garrison Foundry Company of Pittsburgh are building a 38-inch plate mill for the Lukens Iron & Steel Company of Coatesville, Pa. The housings were cast last week and were very heavy.

The Girard Foundry & Machine Company, Girard, Ohio, will build a large addition to their foundry and machine shop.

Jones of Binghamton, Binghamton, N. Y., manufacturer of scales, will erect a new foundry, 45 x 60 feet. No contracts have been let yet.

Frank I. Clark, machinist, Augusta, Maine, is organizing a company to establish a foundry in that city.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, builders of rolls and rolling mill machinery, have recently bought considerable ground adjacent to their plant, which will be used at some time for extensive additions to their works. They have recently received a second 15-ton electrical crane, which is now being installed.

C. A. Gile and C. B. Greene have purchased control of the Morrisville Foundry Company, Morrisville, Vt., and will add to the present line, plows and castings, the manufacture of 5 and 7 horse-power gasoline engines, ensilage cutters and carriers.

F. O. Phillips of Medina, Ohio, has bought the old Medina Foundry and will overhaul it and install new equipment to take up the manufacture of hollow ware.

It is reported that parties from Illinois will establish a large malleable iron foundry in Akron, Ohio. Consumers in that city claim there is a good opening for such a plant.

#### Fires.

The Shenango works of the American Tin Plate Company, at New Castle, Pa., were damaged by a cyclone May 6.

The repair shop of the Erie Railroad, at foot of St. Paul street, Jersey City, N. J., was destroyed by fire May 5, entailing a loss of about \$75,000. There was considerable machinery in the building.

The plant of the Medart Patent Pulley Company, at St. Louis, Mo., was almost entirely destroyed by fire May 4. The loss is estimated at about \$300,000. It is probable that the plant will be rebuilt.

Bartlett, Hayward & Co., Baltimore, Md., suffered a \$7000 loss by fire at their foundry last week.

The main part of the plant of the Bettendorf Axle Company, at Davenport, Iowa, was destroyed by fire May 1. The loss is estimated at \$250,000.

The main building of the plant of the Rogers Rake Company, at Pleasant Valley, Conn., was destroyed by fire May 1. The loss will reach \$12,000.

Thatcher Parker's foundry, at First and Mulberry streets, Terre Haute, Ind., was destroyed by fire last week.

The Hildreth Pump & Motor Works, North Lansing, Mich., sustained a loss of \$25,000 on patterns, building and mill supplies by fire on April 22. Insurance about covers the loss, and the business of the works will not be interrupted.

#### Bridges and Buildings.

The Canton Bridge Company, Canton, Ohio, have announced that they will shortly make improvements which will nearly double the capacity of their plant. A building, 120 x 70 feet, and another, 70 x 40 feet, will be erected and an electric power plant will be installed. About \$40,000 will be spent in improvements and the annual capacity of the plant will be increased to between 7000 and 8000 tons.

#### Hardware.

The Mathews Woven Wire Fence Company of Pittsburgh, manufacturers of woven wire fencing and steel posts, are building a large plant at Donora, Pa., for the manufacture of fencing. The American Bridge Company have the contract for the structural steel for the new plant and will finish their part of the work in two weeks. The Union Lumber Company of Donora have the contract for the brick work and will start this week. The concern hope to be in operation by July 1, and expect to turn out about 50 tons of fencing and steel posts per day. E. C. Mathews is president of the concern.

Collins Plow Company, makers of plows, harrows, cultivators and baling presses, Quincy, Ill., report a very good business. They remark that it is easier to sell goods at the present time

than to procure material out of which to make them. They contemplate making an addition to their plant shortly, which will relieve somewhat the congested condition of their factory.

Owosso Mfg. Company, Owosso, Mich., are very busy and unable to keep up with orders for screen doors, window screens, &c. At the same time they are turning out more goods by 20 per cent. than ever before, and have been for the past eight months.

Barlow Mfg. Company, manufacturers of nickel and brass goods, metal display fixtures, &c., Holyoke, Mass., refer to business as more than double that of last year. They have lately been compelled to move to larger quarters and are now rapidly getting settled in a factory about three times the size of the former plant. One reason for the marked growth in their trade, the company say, is the fact that all their fixtures are interchangeable, making it possible for stands displaying one kind of merchandise to be made with one or two changes into stands suitable for showing some other entirely different class of goods.

Columbus Chain Works, Columbus, Ohio, have awarded contracts for two factory buildings, which when completed will afford additional floor space of 30,000 square feet. The company have their own railroad switches leading into their factory, and the Toledo & Ohio Central Railroad Company are now putting in additional tracks to accommodate the increased facilities, making a total of 1400 feet of switches, which when completed will accommodate on the company's own tracks 35 cars. The city waterworks department are laying an 8-inch main to the plant, insuring fire protection and ample supply for factory purposes.

The Stuart-Howland Company, manufacturers of and dealers in electrical supplies and specialties, 279-287 Devonshire street, Boston, report a large growth in all departments of their business, their sales during the past year showing an increase of 120 per cent. over any previous year. In the street railway department they have been particularly prosperous, having furnished in the season of 1901 in addition to their general supply business the entire overhead and pole equipment (excepting wire) for over 500 miles of new road. They also carry a very complete stock of all kinds of electrical supplies, except heavy machinery, and have now ten salesmen on the road.

Buffalo Hardware Mfg. Company, Buffalo, N. Y., have been incorporated with a capital of \$20,000, \$10,000 being paid in.

Morse Chain Company, Trumansburg, N. Y., manufacturers of bicycle chain, have increased their capital stock from \$100,000 to \$130,000.

New England Enameling Company have been incorporated with a capital of \$50,000. They will manufacture enameled ware in a factory to be located at Middletown, Conn. The incorporators are Jacob H. Newman and Max Mailhouse of New Haven, and Chas. Brown and James H. Barry of Portland. It is expected that the plant will be ready for operation in July.

A new corporation have been organized under the laws of Maine, to be known as the Dover Stamping & Mfg. Company. They have bought of Josselyn & Co. the old plant formerly owned and run by the Dover Stamping Company, Cambridge, Mass. The new company will be officered as follows: President and general manager of the corporation, Richard L. T. Evans, formerly with the Fairbanks Scale Company; treasurer and manager of the manufacturing department, Edward H. Whitney, son of the founder of the original Dover Stamping Company, which started in Dover, N. H., some 40 years ago, moving to Cambridge in the sixties. The new concern will continue the manufacture of the same line of goods as formerly made by the Dover Stamping Company.

Terry Mfg. Company, Toledo, Ohio, have incorporated with a capital of \$10,000. The company will manufacture cutlery.

Jefferson Metal Ware Company, Louisville, Ky., have been organized with a capital of \$20,000. The stockholders are W. T. Hale and J. J. Morris of Louisville, and C. G. Summers of New Albany.

A new industry will soon be established in Tacoma, Wash. The Jordan Mfg. Company have moved their headquarters from Seattle to that city, and general offices have been opened in the Maritime Building, 726 Pacific avenue. The company's plant will be located on the tide flats in connection with the Hardy machine shops. The company have been incorporated with a capital stock of \$200,000. The product of the company will be the Common Sense bolt and nut lock, a device invented and patented by H. Clay Jordan. The lock is designed for use in railroad construction and on agricultural implements, builders' hardware, furniture, vehicles, &c. The officers of the company are H. Clay Jordan, president; John B. Hardy, vice-president; Will P. Jordan, secretary.

The Southern Brass Company, Lexington, N. C., have been incorporated to manufacture furniture hardware, silverware, iron beds, trimmings, novelties, &c., and also to do all kinds of metal plating. The capital is \$10,000, which may be increased to \$50,000. The principal incorporators are H. K. Finger and W. A. Anthony of Salisbury, N. C., and J. L. Peacock and J. H. Alexander of Lexington, N. C.

Rockford Lock Company, Rockford, Ill., have been incorporated with a capital of \$20,000. The new company will manu-



facture locks, hardware and machinery. The incorporators are Charles C. Spengler, George H. Spengler and Rockwood Sager.

The plant of Frederick Voss, Wire & Iron Works, Chicago, was badly damaged by fire on the morning of April 1. The building was of mill construction and of six stories. Reconstruction was begun almost immediately, and at this date work in all departments has been resumed with full force.

The Spring Steel Fence & Wire Company, Anderson, Ind., are now making excavations for a new factory building in which to manufacture wire fencing. This will enable them to double their present capacity, and the output will be at least 30 miles of fencing per day when the new plant is in operation. All buildings will be of brick, and with the exception of the office and storage room, one story, with concrete floors. The new factory will be operated by gas engine, supplied with producers' gas, and will be heated by hot air and lighted by electricity. The office and storage room building will be two stories.

The Rockford Tack & Nail Company, Rockford, Ill., have been organized with a capital of \$50,000. The incorporators of the new company are J. S. Joslyn, Alfred Savage and E. E. Leonard.

Haworth & Sons Mfg. Company, Decatur, Ill., manufacturers of check powers, disk drills and corn and cotton planters, have lately completed a new blacksmith shop, 60 x 120 feet. They have also put electric lights into their plant and added some other new features, which have materially increased their capacity.

F. W. Mann & Co., Milford, Mass., manufacturers of Mann's bone cutters, state that business during the past winter has been of such a nature that they find it necessary to enlarge quite extensively. They are now at work upon an addition which will give them about twice the available floor room of their present plant.

#### Miscellaneous.

Sidney Steel Scraper Company, Sidney, Ohio, during the past year have increased their productive capacity very materially by additions to former buildings and improved machinery and appliances in the various manufacturing departments, until now their capacity has trebled in volume. Trade has been very satisfactory and prospects for a continuance look excellent.

The American Steel Scraper Company, Sidney, Ohio, are erecting a new brick three-story addition to their present plant, 47 x 126 feet, in order to supply much needed additional manufacturing facilities. This, when completed, which will be in about 60 days, will give them approximately one-third increased capacity over the present.

The New York-Pittsburgh Company, organized for the manufacture of typewriting machines, have located at Beaver Falls, Pa., on the site formerly occupied by the Shelby Steel Tube Company. The concern are incorporated under the laws of New York, with a capital of \$100,000. Work on the building of a new plant will start at once. S. R. Hays of New York is president and W. A. McCool of Beaver Falls is general manager.

The Mandt Wagon Company, Moline, Ill., will be incorporated with a capital stock of \$150,000 and will operate the plant as heretofore, making the genuine T. G. Mandt wagon, which will probably be sold by some of the branch houses of the Moline Plow Company, as many of the stockholders in the Mandt Wagon Company are also stockholders in the Moline Plow Company.

The Stonega Coke & Coal Company, 712 Reading Terminal, Philadelphia, Pa., have incorporated for the manufacture of coke and to mine and sell coal from lands leased from the Virginia Coal & Iron Company in Wise County, Virginia. They will also operate the Stonega coke plant, consisting of 666 ovens, owned by the Virginia Company at Stonega, Va., and will build an additional plant of 400 to 500 ovens, of which from 200 to 300 ovens will be completed this year. The incorporators are John S. Wentz, Daniel B. Wentz, Robert H. Sayre, Samuel Dickson, W. Beaumont Whitney, John L. Wentz and W. D. Lipincott.

The C. E. Sears Canning Company of Circleville, Ohio, are putting up an addition and installing new machinery which will increase their daily output to 60,000 tin cans. An electric light plant will also be installed.

The Chamberlain Cartridge & Target Company of Findlay, Ohio, are preparing to erect an addition to their factory. New machinery will be installed.

The Niles Galvanizing Company of Niles, Ohio, have incorporated with \$10,000 capital stock. Incorporators: H. J. Robbins, George B. Robbins, F. C. Robbins, W. H. Smiley and F. W. Stillwagon.

L. Schwab has sold his safe manufacturing plant at Fostoria, Ohio, and has purchased a similar plant located at Cincinnati, which he will remove to Toledo. A site has been secured on the Toledo Railway & Terminal Company's tracks and work will start in the near future on a building 300 x 50 feet.

The Sharon Supply Company of Sharon, Pa., have been granted a charter with a nominal capital of \$10,000. The directors are John Stevenson, Jr.; Klaus Steiner and J. P. Whittala of Sharon, G. H. Flinn of Pittsburgh and George W. Darr of New York. This concern are an identified interest of the Sharon Steel Company.

The Southern Metal Company, Orangeburg, S. C., who were incorporated and began business on February 15 last, are now manufacturing tin goods and a general line of sheet metal work. The company's factory is equipped to manufacture cornices, skylights and a patent eaves trough hanger, the invention of their manager, J. B. Outland, and they are also preparing to manufacture steel ceilings. They are having four sizes of dies made by the E. W. Bliss Company of Brooklyn, N. Y., for the manufacture of the seeder cups which accompany the Hoffman Universal seeder, of which they are the sole manufacturers. The company report having met with a good business since their start. Among the recent contracts booked is one for 3000 of the Hoffman Universal seeders. The company are prepared to undertake all kinds of special work in sheet metals, also light wrought iron work. The officers of the concern are Dr. W. S. Barton, president; Dr. D. Hydrick, secretary and treasurer, and J. B. Outland, manager.

The Niles Iron & Steel Roofing Company, Niles, Ohio, will remove their plant from its present location to a site adjoining the plant of the Niles Mine & Mill Supply Company. The company will be provided with a considerable extension of capacity at their new location. A one-story building, 72 x 200 feet, is being constructed and will be ready for occupation within 90 days.

The Harrington & King Perforating Company, Chicago, have issued an announcement to the trade, under date of May 1, that they have removed their New York office to 114 Liberty street, in the new Engineering Building, situated in the heart of the machinery district, where with all the conveniences of modern equipment and a full line of samples they are prepared to give quotations as low as strictly first-class work will permit. They refer to the output of their Chicago plant as embracing every department of perforated metal work, from the finest to the largest of perforations and of such a variety of shapes of openings, in light and heavy metal, that scarcely any specification is beyond their reach.

The Main Belting Company, Philadelphia, Pa., have plans prepared for a substantial addition to their plant.

The Ohio Brass Company, Mansfield, Ohio, state that orders covering their entire output for one year have been booked, compelling them to erect a large and substantial additional new building which will greatly increase their present capacity.

The Southern Car & Foundry Company, Birmingham, Ala., have purchased from the Illinois Car & Equipment Company the entire plant and equipment in Anniston which they have operated for the last ten years under lease.

The Chain Belt Company, Milwaukee, Wis., have plans prepared for a new factory, to cost about \$20,000. It will be of brick and three stories high.

The Uehling-Steinbart Mfg. Company, manufacturers of engineering and metallurgical instruments, announce the removal of their Carlstadt and New Brunswick plants on May 1 to Passaic, N. J., where all communications should be addressed.

The Speed Changing Pulley Company, Indianapolis, Ind., are making arrangements to double the capacity of their plant.

New York and Chicago capitalists will erect a \$1,000,000 refinery for the manufacture and refining of grape sugar and the manufacture of starch and glucose. No site has as yet been selected, but the plant will be located in the corn belt, the principal requisites being cheap corn, coal and water. C. W. Post, chairman of the Postum Cereal Company, Limited, Battle Creek, Mich., who owns all the stock of the Cereal Sugar Company, now successfully conducting a plant in Peoria, Ill., making about 17,000 pounds of grape sugar per day, will merge with the new company.

A. H. Handlan, president of the Handlan-Buck Mfg. Company, St. Louis, Mo., manufacturers of and dealers in railway supplies, has purchased the Wetmore tobacco plant, at Fourteenth and Papin streets, which will probably be occupied by a department of the Handlan-Buck Company.

It is probable that the Thomas Mfg. Company, Springfield, Ohio, manufacturers of agricultural machinery, will enlarge their plant, as they are in need of more room.

The plant of the American Spring & Mfg. Company at Chagrin Falls, Ohio, is to be sold at receiver's sale in Cleveland, May 10. The plant includes brick buildings 300 x 50 feet, 42 x 30 feet, and 30 x 40 feet, equipped with steam and electric power. D. M. Glasscock, Cleveland, is receiver.

W. H. Mullins of Salem, Ohio, manufacturers of metal row-boats and skiffs, is securing business from all parts of the world. He has recently shipped boats to St. Petersburg, Russia; Soudan, Egypt; Madras, India, and other foreign points. If desired, these goods are made in sections so that they can be taken apart and stored in a very small space. Catalogues just published describe his various productions.

A consolidation of the Star Aluminum Company of Doylestown, Ohio, and the Bay State Aluminum Company of Massachusetts, has been effected by W. C. Spencer of Akron, vice-president of the Star Company. It is stated that the Bay State plant will be removed to Doylestown and the line of products of the two concerns will be enlarged. Heretofore the Doylestown concern have manufactured combs and the Bay State Company, cooking utensils.



## The Iron and Metal Trades.

The markets in raw materials are quiet because there is exceedingly little offering for early delivery. The balance seems still to be against consumers, who are pressing to a moderate extent for additional supplies. The effect is an exceedingly strong market with a rising tendency.

In Pig Iron little relief is in sight for the early future. There are reports of sales of foreign Pig, emanating chiefly from England. They refer to a sale of 5000 tons of Hematite Pig, to a sale of a round quantity of Special Low Phosphorus Iron and to a moderate quantity of Scotch Pig. It looks as though our market were getting close to the point at which larger quantities might be brought in. Some American Iron in store in England is being offered, but above the market.

Some business has been done in Chicago and in the Central West in foreign Billets and Sheet Bars. In the case of Billets of guaranteed special analysis the increased duty due to the higher valuation is a bar to business.

There is a good deal of inquiry for foreign Structural Material. Although the cost figures out in the neighborhood of 1.70 cents per pound, duty paid, which is considerably below actual selling price here, the business is not easy to put through because of the difficulties relating to sections, &c.

Considering the heavy sales of Finished Iron and Steel made during the late winter and spring, the demand keeps up surprisingly well. Large interests, who had begun to catch up in their orders to some extent, find that the daily requirements are rather against immediate relief. The tonnage of Structural Material which continues to come up is very heavy, and the Plate trade, East and West, is so fully employed that new work is difficult to place. The Western Bar mills received considerably more orders after the April advance than they expected.

There is a good deal of uneasiness about the labor situation. The danger of a strike among the miners in the anthracite fields does not directly affect more than a relatively small part of the Iron trade, but it may prove troublesome by putting fresh pressure on the Coke makers by the diversion of furnaces and foundries from Hard Coal to Coke.

The trouble among the puddlers in Central Pennsylvania may develop some scarcity in Bars, Skelp and other rolling mill products in the Eastern section of the country.

In different parts of the country the molders and core makers are on strike.

Finally, there is looming up the possibility of interference with the production of Pig Iron in the Central West through the demands of the furnace workers, who threaten to go out on June 1.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type, Declines in Italics.

	May 7, 1902.	Apr. 30, 1902.	Apr. 9, 1902.	May 8, 1901.
<b>PIG IRON:</b>				
Foundry Pig No. 2, Standard, Philadelphia .....	\$19.75	\$19.75	\$19.75	\$15.25
Foundry Pig No. 2, Southern, Cincinnati .....	17.75	17.75	16.25	14.00
Foundry Pig No. 2, Local, Chicago .....	<b>20.00</b>	19.50	18.50	15.50
Bessemer Pig, Pittsburgh .....	<b>20.75</b>	20.00	18.25	16.25
Gray Forge, Pittsburgh .....	<b>19.75</b>	19.75	18.25	14.75
Lake Superior Charcoal, Chicago .....	22.50	22.50	21.50	18.00
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh (nom.) .....	33.00	32.00	33.00	24.00
Steel Billets, Philadelphia .....	<b>33.50</b>	33.00	33.00	26.25
Steel Billets, Chicago .....	.....	.....	.....	28.00
Wire Rods, Pittsburgh .....	<b>37.00</b>	36.50	36.00	39.00
Steel Rails, Heavy, Eastern Mill (nominal) .....	28.00	28.00	28.00	28.00
Spikes, Tidewater .....	2.00	2.00	2.00	1.80
Splice Bars, Tidewater .....	1.60	1.60	1.60	1.40
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago .....	17.50	17.50	17.60	13.50
O. Steel Rails, Philadelphia .....	21.00	21.00	.....	16.75
O. Iron Rails, Chicago .....	24.00	24.00	24.00	19.00
O. Iron Rails, Philadelphia .....	<b>26.00</b>	26.00	25.00	19.50
O. Car Wheels, Chicago .....	<b>20.00</b>	19.00	19.00	16.50
O. Car Wheels, Philadelphia .....	<b>19.50</b>	19.50	17.75	17.50
Heavy Steel Scrap, Chicago .....	<b>17.50</b>	16.50	16.50	13.50
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia .....	1.92	1.92	1.92	1.50
Common Iron Bars, Chicago .....	1.90	1.90	1.85	1.55
Common Iron Bars, Pittsburgh .....	1.80	1.80	1.80	1.45
Steel Bars, Tidewater .....	1.80	1.80	1.80	1.62½
Steel Bars, Pittsburgh .....	1.60	1.60	1.60	1.40
Tank Plates, Tidewater .....	1.95	1.95	1.78	1.80
Tank Plates, Pittsburgh (nom.) .....	1.60	1.60	1.60	1.60
Beams, Tidewater .....	<b>2.00</b>	1.95	1.85	1.75
Beams, Pittsburgh (nom.) .....	1.60	1.60	1.60	1.60
Angles, Tidewater .....	<b>2.00</b>	1.85	1.75	1.75
Angles, Pittsburgh (nom.) .....	1.60	1.60	1.60	1.60
Skelp, Grooved Iron, Pittsburgh .....	<b>2.25</b>	2.10	1.95	1.75
Skelp, Sheared Iron, Pittsburgh .....	2.15	2.15	2.00	1.85
Sheets, No. 27, Pittsburgh .....	3.00	3.00	3.00	3.20
Barb Wire, f.o.b. Pittsburgh .....	2.90	2.90	2.90	2.90
Wire Nails, f.o.b. Pittsburgh .....	2.05	2.05	2.05	2.30
Cut Nails, Mill .....	2.05	2.05	1.95	2.00
<b>METALS:</b>				
Copper, New York .....	<b>11.87½</b>	11.75	12.00	17.00
Spelter, St. Louis .....	4.72	4.15	4.22½	3.85
Lead, New York .....	4.10	4.10	4.10	4.37½
Lead, St. Louis .....	4.00	4.00	4.02½	4.20
Tin, New York .....	28.25	28.25	27.50	26.30
Antimony, Hallett, New York .....	8.00	8.00	8.00	8.75
Nickel, New York .....	50.00	50.00	50.00	55.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York .....	4.19	4.19	4.19	4.19

## Chicago.

FISHER BUILDING, May 7, 1902.—(By Telegraph.)

The ultra conservatism that has been a prominent feature of the Iron and Steel situation for many months is still struggling for the ascendancy, but there is evidence that the market is slowly but surely slipping from control. This is especially true of the Pig Iron market, which has been little less than wild during the week, prices on some grades of both Northern and Southern Iron varying from 50c. to \$1.50 per ton, and in the unsettled state it is difficult to give reliable quotation. The volume of business has been relatively light, simply because the Iron has been unobtainable. Scrap Iron has sympathized closely with Pig and prices of many kinds of Old Material have advanced materially, with a great scarcity of desirable Scrap. Labor troubles in other sections, present and prospective, are having some influence. One feature of significance is that buyers of Structural Material are placing orders for next year's delivery, which is very unusual, as far as such Finished Shapes are concerned. The demand for new Rails has continued active, and while some orders have been placed buyers have been unable to satisfy their needs, and in some instances have eked out by purchasing old Relaying Rails. The demand for Billets, both foreign and domestic, has continued active, but it is almost impossible to obtain any large quantities of domestic man-

ufacture. However, one sale has been made during the week of 2000 tons for delivery during the last half of the year, while 4000 tons of foreign Small Billets have been sold for July and August delivery at Chicago, upon the basis indicated a week ago. There has been less demand for Plates and Sheets, Plates being the one slow spot in the market.

**Pig Iron.**—While the market may be said to have been free from excitement in some respects it has been wild, prices advancing sharply from 50c. to \$1.50 per ton, and in not a few instances there being a variation of from \$1 to \$2 per ton on the various grades of both Southern and Northern Iron. In fact, prices have been governed by the urgency of the buyer or the temerity of the seller to demand. The volume of business has been relatively light, as spot Iron is scarce and very few furnaces are in a position to take further orders of moment even for long delivery. However, there have been numerous sales of carloads and not infrequent sales of from 100 to 500 ton lots for delivery during the last quarter of this year, and even extending into next year. There are reports that a number of foundries have preferred to shut down rather than pay the present prices current, but this seems to be rather the exception than the rule. Not a few buyers who have orders for Castings on their books, which were supposed to have been covered by orders placed for Pig Iron some time since, suddenly find themselves forced into the market because of the failure of furnaces to make deliveries contracted for. These urgent buyers have been either willing or forced to pay the high prices now prevailing. The labor troubles already experienced or in sight are having something to do with molding the opinion of both buyers and sellers. In addition to the new furnaces already contracted for, two others on the great lakes have been arranged for. Little relief, however, can be expected from any such increase in output for many months to come, and reports are being received of old furnaces working less satisfactorily. Many of them have been in blast much longer than usual and suspension of blowing, temporarily at least, will be necessary for relining or other repairs. Less and less is heard of the \$12, Birmingham, basis for No. 2 Foundry, and several buyers who have relied upon the assurance that they could obtain supplies at the official prices for the last quarter of the year have become discouraged and entered the market for moderate amounts the past week. We quote as follows:

Lake Superior Charcoal.....	\$22.50 to \$23.25
Local Coke Foundry, No. 1.....	21.00 to 22.00
Local Coke Foundry, No. 2.....	20.00 to 21.00
Local Coke Foundry, No. 3.....	19.50 to 20.50
Local Scotch, No. 1.....	20.00 to 22.00
Ohio Strong Softeners, No. 1.....	23.10 to 23.35
Southern Silvery, according to Silicon.....	20.40 to 20.90
Southern Coke, No. 1.....	19.65 to 20.65
Southern Coke, No. 2.....	19.15 to 20.15
Southern Coke, No. 3.....	18.65 to 19.15
Southern Coke, No. 1 Soft.....	19.90 to 20.65
Southern Coke, No. 2 Soft.....	19.15 to 19.90
Foundry Forge.....	18.15 to 18.65
Southern Gray Forge.....	18.15 to 18.65
Southern Mottled.....	18.15 to 18.65
Southern Charcoal Softeners, according to Silicon.....	18.65 to 19.15
Tennessee Silicon Pig.....	21.65 to 22.15
Alabama and Georgia Car Wheel.....	22.65 to 23.15
Malleable Bessemer.....	21.00 to 21.50
Standard Bessemer.....	20.00 to 20.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	21.00 to 21.60

**Bars.**—Fewer large contracts have been placed during the week for either Iron or Steel Bars and there has been less demand even for moderate amounts of Iron Bars, as prices are relatively higher than Steel and buyers are disposed to be less pressing. There is little if any change in the condition of the mills. Such new orders as are placed are taken on the basis of 1.90c. to 1.95c., Chicago, for mill shipments, while the business from store continues to be on the basis of 2.25c., full extras. There have been steady sales of moderate quantities of Steel Bars, and while the inquiry has been stimulated by labor troubles in sight, the actual tonnage has been rather contracted than otherwise on this account. Prices have continued at 1.75c. to 1.90c., mill shipment, for Soft Steel Bars, 2.15c. to 2.25c. for Hoops, base, and 2.25c. to 2.40c. for Angles, base. The jobbing trade has continued on a liberal scale, with a strong tone and full prices readily obtained. Small Angles sell at 2¼c., Soft Steel Bars at 2c. to 2.25c., and Hoops at 2¼c., base, from store.

**Structural Material.**—There has been an increased tonnage of Structural Material placed during the week, there being freer buyers for very late delivery. Several lots ranging from 1000 to 3000 tons have been placed for delivery extending into the first of next year and contracts involving 20,000 tons are pending, but the volume of business has been mainly in small quantities. Were it possible to obtain assurance of definite delivery there would be a very material increase in the volume of business, as there are many buildings in and around Chicago which are projected, but held in abeyance because of the impossibility of obtaining Structural Shapes inside of ten months or so. It is significant, however, that some buyers are willing to enter the market and take their chances of delivery during the first quarter of next year. While buying so long ahead is not unusual in other lines, it is quite out of the ordinary in Structural Material. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.75c. to 1.90c.; 18 inches and over, 1.85c. to 2c.; Angles, 1.75c. to 1.90c. rates; Tees, 1.80c. to 1.90c.; Universal Plates, 1.75c. to 1.85c. Small lots of Beams and Channels from local yards are quoted at 2.50c. to 3.50c.; Angles, 2.50c. to 3.50c. rates; Tees, 2.55c. to 3.50c. rates.

**Plates.**—There has been a marked falling off in the number of orders received for Plates, both for mill shipment and from store. This seems to be the one quiet spot in the market. While some large mills are sold ahead five to eight months, others are but a few weeks behind in filling orders, instead of months, as is the case with other material, and stocks in store also are liberal. It is reported that one large Plate mill in this section has been shut down, but while this is so it is temporary, for repairs only, and the mill will be running again in a few days. There has been no change in prices, the market remaining steady. Mill shipments are quoted as follows: Tank Plate, ¼-inch and heavier, 1.75c. to 1.90c.; Flange, 1.95c. to 2c., and Marine, 2.15c. to 2.25c., Chicago.

**Sheets.**—There have been a few important sales of Sheets, several thousand tons having been sold for delivery during the last half of the year, but the aggregate volume of business has been less, there being less pressure from buyers, but the tone of the market has continued firm. Mill shipments of No. 27 Black Sheets are quoted at 3.15c. to 3.25c., Chicago, and small lots from store at 3.45c. to 3.55c. Galvanized Sheets are quoted at net prices, mill shipments being held on the basis of 4.35c. to 4.50c., Chicago, and small lots from store at 4.70c. to 4.75c. for No. 27.

**Cast Pipe.**—There has been less activity in the market, the demand from Gas and Water Pipe companies being less urgent and few, if any, municipal contracts placed during the week, but there has been a fair volume of business in the aggregate and the tone of the market has continued firm. Cast Iron Water Pipe is quoted by manufacturers as follows: 4-inch, \$30; 6-inch, \$29; 8-inch and larger, \$28.50, and Gas Pipe, \$1 per ton higher, Chicago.

**Merchant Pipe.**—The market has been without animation, yet there has been a moderate volume of business, made up of small orders, and prices have remained steady as previously quoted. Carload lots are quoted as follows, random lengths: Black, ¼ to ½ inch, 56½ off; ¾ to 12 inches, 63½ off; Galvanized, ¼ to ½ inch, 43½ off; ¾ to 12 inches, 50½ off.

**Boiler Tubes.**—There have been no special features and only a moderate volume of business has been transacted, but prices have been maintained at the recent advance. Quotations are as follows:

	Steel.	Iron.
1 to 1¼ inches.....	35	35
1½ to 2¼ inches.....	50	32½
2½ inches.....	50	35
2¾ to 5 inches.....	57½	42½
6 to 13 inches.....	52½	..

**Merchant Steel.**—The market has been less buoyant, yet in the aggregate there has been a fair volume of business and the mills have been glad of the short respite from new contracts. With the exception of makers of harvesters and of corn cultivating machinery the implement manufacturers have about covered their wants for this year. A few who have been in the market have



wanted only small amounts for immediate delivery. Mill shipments are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.95c. to 2.10c.; Open Hearth Spring Steel, 2.45c. to 2.55c.; Toe Calk, 2.25c. to 2.40c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 50 off in carload lots. Ordinary grades of Crucible Tool Steel are quoted at 7c. for mill shipments; specials, 12c. upward.

**Rails and Track Supplies.**—The urgent demand for New Rails previously noted has resulted in the sale of 5000 tons of Heavy Sections at the official price for delivery during the last quarter of this year and the first quarter of 1903. Buyers being unable to obtain all New Rails required, however, were compelled to purchase some Old Rails for relaying. Heavy Sections continue to be officially quoted at \$28 and Light Sections are in demand at \$33 to \$35. There has continued to be a good demand for moderate amounts of Track Supplies, and the market has continued firm. Fastenings are quoted as follows in carload lots: Splice Bars or Angle Bars, 2c.; Spikes, 2.30c. to 2.40c.; Track Bolts, with Hexagon Nuts, 2.85c. to 3.10c.; Square Nuts, 2.70c. to 2.95c.

**Billets.**—The feature of the week has been a sale of 4000 tons of foreign Small Billets upon which there was a premium of 2 shillings at \$32.25, Chicago, for July and August delivery. These Billets were a portion of the 15,000 tons pending sale a week ago. Other sales have not been consummated owing to the advance in freight rates, but local agents insist that 4-inch Billets can be laid down on a basis of \$31.75 to \$32, Chicago, even with the advance in freight. The fact remains, however, that domestic Billets are preferred and would bring a premium over the foreign production, \$33 being offered for Bessemer domestic Billets, Chicago. Two thousand tons of Open Hearth Forging Billets have been sold for delivery during the second half of the year at about \$36, Chicago, but prices range from \$36 to \$42, according to the urgency of the buyer and time of delivery.

**Old Material.**—There has been an increased demand for all kinds of Old Material and higher prices have prevailed for many kinds, with light offerings of desirable Scrap. The demand for Relaying Rails has increased, with sales of 3000 tons by the Pennsylvania Railroad at \$31, Chicago, and further sales are pending on this basis. Three hundred tons of Rails for rerolling are reported to have been sold at \$24 spot. Two thousand tons of Heavy Mixed Scrap, including Axles and Rails, have been sold to mills at \$24, Chicago. The following are the approximate quotations per gross ton:

Old Iron Rails.....	\$24.00 to \$25.00
Old Steel Rails, mixed lengths.....	17.50 to 18.00
Old Steel Rails, long lengths.....	24.00 to 25.00
Heavy Relaying Rails.....	30.00 to 31.00
Old Car Wheels.....	20.00 to 20.50
Heavy Melting Steel Scrap.....	17.50 to 18.00
Mixed Steel.....	15.50 to 16.00

The following quotations are per net ton:

Iron Fish Plates.....	\$22.00 to \$22.50
Iron Car Axles.....	24.00 to 24.50
Steel Car Axles.....	21.50 to 22.00
No. 1 Railroad Wrought.....	20.00 to 21.00
No. 2 Railroad Wrought.....	18.00 to 19.00
Shafting.....	18.50 to 19.00
No. 1 Dealers' Forge.....	16.00 to 16.50
No. 1 Bushing and Wrought Pipe.....	13.50 to 14.00
Iron Axle Turnings.....	13.50 to 14.00
Soft Steel Axle Turnings.....	13.50 to 14.00
Machine Shop Turnings.....	13.00 to 13.50
Cast Borings.....	9.00 to 9.25
Mixed Borings, &c.....	9.50 to 10.00
No. 1 BOLLERS, cut.....	13.00 to 13.50
Heavy Cast Scrap.....	14.50 to 15.00
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	16.00 to 16.50
Agricultural Malleable.....	14.00 to 14.50

**Metals.**—There has been a quiet but steady market for Copper, with 13c. the prevailing price for carload lots of Lake. Pig Lead has been in moderate demand and steady at 4.05c. for Desilverized. Selling prices on small lots of Old Metals are as follows: Heavy Cut Copper, 11½c.; Red Brass, 11¼c.; Copper Bottoms, 10¼c.; Pipe Lead, 3.90c.; Zinc, 3.20c.

**Coke.**—There has been a fair movement, supplies being ample of all kinds and the market steady at previous quotations. Spot Coke is selling at \$5.50 and contracts are unchanged at \$5.25 for Standard 72-hour Connells-

ville Foundry Coke, Virginia and West Virginia Cokes selling at \$5 to \$5.50.

W. W. Backman, dealer in Pig Iron and Coke, has moved his office from room No. 1447 to room No. 951 Marquette Building, Chicago.

## Philadelphia.

FORREST BUILDING, May 6, 1902.

The Iron and Steel markets have not been unusually active during the past week or two, but prices appear to be hardening all the time. The scarcity of Pig Iron is as great as ever, and the prospect of relief appears to be no nearer than it was a month ago, hence there is great disparity in prices. For May and June shipments anything like exact quotations are impossible, as the price depends upon the circumstances in each individual case. If the sale included a fair proportion of tonnage for the last half of the year the price might be averaged at about \$20 for No. 2 X, but if it was all for delivery during the next 60 days \$21 would be a more approximate figure. Moreover, a purchase for deliveries during the last quarter could probably be done at a little less than \$20, but it is a surmise entirely, as the situation is liable to change at short notice. Iron is scarce, however, there can be doubt about that, and sellers are in a position to ask what they please, and if one buyer objects there are plenty of others to fall back upon. But there is a general disposition to be as easy as circumstances will permit, and no complaints are made that asking prices are beyond what the market warrants. In the Finished Iron and Steel trades there is rather more uniformity. Structural Material is very scarce and prompt deliveries are out of the question for mill specifications. Imported Shapes from stock can be had in moderate quantities, but it is almost impossible to get a full line from mills without tedious waits. The Plate mills are under constant pressure and a great deal of business is either turned down entirely or taken subject to delays. Bar mills are very busy, and as several of the leading mills have suspended work pending an adjustment with labor, there is some prospect of a shortage in Bars. The general outlook is extremely favorable, and if business is not demoralized by strikes and other unforeseen occurrences the remainder of the year ought to be one of activity and with satisfactory results from a pecuniary point of view.

**Pig Iron.**—Opinions are a little divided in regard to the exact status of the market. Furnaces appear to be doing better work than for several months past, and in that way deliveries on old contracts have been a trifle better. New business is hard to place, unless by paying extremely full figures, which, however, does not bring in a large tonnage unless inducements are made, which must include some Iron for June and July. It is just possible that the arrival of foreign Iron is having some influence, and moreover the suspension of work at mills in the Harrisburg district will curtail consumption temporarily. The situation may be summarized as follows: The furnaces are doing better work, consumption may be more or less restricted during the next two or three months and the arrival of foreign material in the way of Scrap, Pig, Steel, Structural Material, &c., is bound to have some effect, consequently buyers are less disposed to run after metal at high prices. The market is, in fact, taking a breathing spell. There is nothing to indicate weakness, but there is evidently a desire to take new soundings before making further commitments. Sales during the week have been on the basis of \$19.75 to \$20.50 for No. 2 X Foundry, and good Mill Iron at \$18.35 to \$19, prices graded according to the dates for shipments. For strictly May and June deliveries 50 to 75 cents more would have to be paid, but the range is about as follows for Philadelphia or nearby deliveries, covering the last four months of the year:

No. 1 X Foundry.....	\$20.50 to \$21.50
No. 2 X Foundry.....	19.75 to 20.50
No. 2, Plain.....	19.25 to 19.75
Standard Gray Forge.....	18.25 to 18.50
Ordinary Gray Forge.....	17.75 to 18.00
Basic (Chilled).....	19.00 to 19.50

**Billets.**—It is very difficult to quote exact prices, as so little business is being done. Foreign is offered at about \$32, ex-ship, duty paid, for Ordinary Soft Steel, and \$34 to \$35 for Sheet Bars. American Steel nominal at \$33.50 to \$34.50.

**Plates.**—There is plenty of business and mills would be glad to have a respite before taking in anything additional. Prospects are unimpaired and prices strong as quoted last week—viz.: Universals, 1.95c. to 2c.; Sheared, 1.95c. to 2c.; Flange, 2c. to 2.10c.; Fire Box, 2.15c. to 2.20c.; Marine, 2.25c. to 2.30c.; Charcoal Plates: C.H. No. 1, 2½c.; C.H. No. 1 Flange, 3c.; C.H. No. 1 Flange Fire Box, 3½c.

**Structural Material.**—A great deal of work is looming up in the near future. The new hotel to be built at Broad and Walnut streets by the manager of the Waldorf-Astoria will require a very heavy tonnage, and the new 16-story department store to be built on the Mint site will be another big job. Meanwhile several months' work is already on the books of the largest mills, so that the stringency of the past half year looks like continuing indefinitely. Some foreign material can be had promptly, but mill specifications are subject to long delays. Prices nominally as follows: Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.; Angles, 1.75c. to 1.85c. Store prices for immediate deliveries are about 2.25c. to 2.50c. for imported Angles.

**Bars.**—The lockout at the mills in the Harrisburg district may cause a considerable shortage temporarily, but it is difficult to say what may happen when a strike is on. Meanwhile prices are naturally very firm, and will be higher if there is any prospect of the strike continuing or extending. Prices firm as follows: Iron Bars, 1.92c. to 1.95c.; Steel Bars, 1.80c. to 1.85c.

**Sheets.**—The demand is not unusually active, but manufacturers are glad to have an opportunity to accumulate a little stock, which is sure to be wanted during the summer months. Prices for carload lots and upward of best Sheets (and a tenth less for common qualities) are about as follows: No. 10, 2.10c. to 2.20c.; No. 14, 2.40c.; Nos. 16 and 17, 2.80c.; Nos. 18-21, 3c.; Nos. 26, 27, 3.10c.; No. 28, 3.20c.

**Old Material.**—Prices are inclined to sell off a little on account of the local mills postponing shipments, and also because of receipts from foreign countries, which may be larger than has been expected. Bids and offers are about as follows for deliveries in buyers' yards: Low Phosphorus Scrap, \$25 to \$26; Heavy Melting Steel, \$21 to \$22; Steel Rails, short lengths, \$21 to \$22; Choice Railroad Scrap, \$24 to \$25; No. 1 Yard Scrap, \$20 to \$21; No. 2 Light Forge, \$17 to \$18; No. 2 Light, old, \$15 to \$16; Machinery Cast, \$17.50 to \$18; Iron Rails, \$26 to \$27; Old Car Wheels, \$19.50 to \$20.50; Iron Axles, \$27 to \$28; Steel Axles, \$25 to \$26; Wrought Turnings, \$16 to \$17; Cast Borings, \$9.75 to \$10.25.

## Cleveland

CLEVELAND, OHIO, May 6, 1902.

**Iron Ore.**—To those persons who are interested in the transportation of Iron Ore on the chain of lakes the developments of the past week have been interesting and surprising. The United States Steel Corporation and some of the other big shippers began to develop the policy which is to govern their actions during the season, much to the discomfiture of many of the vessel owners, who in the interest of higher contract rates refused to accept contracts at 75c. The Ore trade is now being called upon to find employment for almost all of the down bound boats. The grain trade has fallen flat and the package freight business of the lakes is either lacking or has not started. This throws both grain and line boats into the Ore trade, and the shippers are having three vessels to one wild cargo. The advantage is pre-eminently with the Ore shipper, who, however, refuses to make an onslaught to force the rates down. The question of rates is not touched, all attention being given to dispatch and to transportation of the material. With the best efforts of the shippers and dockmen along

this line, the boats have been bunching badly both at the head of the lakes and along the south shore of Lake Erie, and at the latter place the cars have been scarce for a week, making the direct movement from the boats to the furnace stock piles rather laggard.

**Pig Iron.**—The principal interest to the furnaceman has been shifted from the possibility of sales to the greater possibility of a lessening of production through a ruction between the owners of the stacks and the men who work the furnaces. The men have announced their intention to strike June 1 if their demands are not granted for an eight-hour day with no reduction in pay. The one possibility which may prevent this is that the furnace workmen will not all be organized, concerning which there is a very serious question at present. The production of the stacks at the present time is at the maximum. All of the conditions seem to conspire to permit the best possible results from the operation, in the Valleys especially. The Coke supply, according to the latest report, is above the demand, and there is no shortage of Ore, nor is there lack of equipment with which to handle the material. There is some little difficulty in shipping the Iron after it has been made, but in this respect the furnaces confess to fare better than most lines of industry depending upon the railroads. Sales now are very light because there is not very much Iron to sell. Most of the transactions have been in off Irons, while some Malleable has been sold during the past week. Valley No. 2 Foundry has been sold in small lots at \$20 at the furnace, and Southern Ohio furnaces have closed for small lots on the same basis. Southern furnaces are quoting \$16, Birmingham, on No. 2 Foundry, and are selling small quantities. The off Irons are bringing almost up to the basis of standard sales. Bessemer and Basic producers are still off of the market, having no material whatever for sale. The shipments on contracts are quite up to the terms if not in excess of them. No prices are being quoted here.

**Finished Material.**—The demand for Plates seems to be one of the leading features of a market that generally maintains the high tension which it has been on for several months. The smaller mills, which were a source of last resort for those who use Plates, have been about sold out and are able to furnish no large quantities. The Eastern mills are having a demand from their own territory that prevents the shipment into this market of any considerable amount of Steel, and those industries which need Plates are forced to go without them. During the week a couple of big Steel ship orders were turned away because the Plates for them could not be found. The scarcity of Structural Steel also had something to do with the refusal of this order. Those who have any Plates are now selling them at a premium of \$2 a ton universally and some small lots have been covered at 1.80c. The supply even at that price is not large. Some of the jobbers that carried certain amounts of 3-16-inch Plates have been selling them at 1.90c. to 2c. out of store and the stock has been about exhausted. The demand for Structural Steel is maintained and the supply is still short. There is a strong possibility that some of the projects for new buildings which have been undertaken here of late will have to await a more opportune time, since the local market does not afford the material and the foreign supply is obtainable only at a price which is prohibitive for this territory. The quotations nominally are 1.70c. on mill sales and from 2¼c. to 3c. on store sales. The demand for Sheets has kept up steadily and the prices have not changed, although the market is strong. The material seems plentiful and deliveries are possible in a comparatively short time, affording the only easy portion of the market. The quotations have not changed in the least. Most of the sales here have been out of store, and on them 2.50c. for No. 10 is the basis on gauges up to 16, while 3.50c. to 3.60c. for No. 27 is the basis on those gauges between 17 and 28. This holds on one pass cold rolled, with full cold rolled being quoted at 10c. extra. Mill sales are still on the basis of 3c. for No. 27, although these are comparatively light in this territory. The Bar sales have died down. There are a few transactions now and then covering small lots, but they do not aggregate any large



tonnage. On these sales the prices are holding well up, the market being firm on the higher plane. Bar Iron is universally quoted now at 1.80c., Pittsburgh, and Bessemer Bar Steel at 1.60c., Pittsburgh, with Open Hearth Steel Bars at 1.70c., Pittsburgh. The slight buying is not an indication of a lack of demand, but rather the acknowledgment of the buyers that the supply for the year has been well sold up. Buyers generally seem to have come to a thorough understanding of the situation and they have in a large measure ceased to inquire for material. Some believe that this augurs no good for the future market conditions, but on this score the Steel makers are optimistic. There has been some inquiry for Rails recently for electric line purposes, and there being no material for sale, some of the promoters have resorted to the use of seconds, which has brought about a good demand for that material.

**Old Iron.**—The market has been firm, with the demand for Scrap fairly good and the supply heavy. The quotations do not change. We quote: No. 1 Wrought, \$19.50 net; Iron Rails, \$27.50 gross; Iron Axles, \$26 net; Cast Borings, \$10 gross; Wrought Turnings, \$15.25 gross; Cast Scrap, \$15.50 net; Car Wheels, \$19 gross; Heavy Melting Steel, \$19 gross; Old Steel Rails, \$20 gross.

### Cincinnati.

FIFTH AND MAIN STS., May 7, 1902.—(By Telegraph.)

For anything that appears upon the surface the general situation in Pig Iron, especially Southern Iron, is absolutely unchanged from what it was a week ago. The feeling is now pretty general that the so-called combination quotations are a dead issue, and reference to them in the way of crediting them with any value in the general situation is out of the question. The amount of selling in this territory is at present very small, and there is quite an anxious inquiry for all sorts of Foundry Iron for immediate delivery. The fact that immediate delivery Iron is not to be had seems to be but dimly understood by a large number of Iron users, who continue to send in for quotations and in some cases send their orders as though they actually expected their Iron to be forthcoming. Selling agencies with branches in other districts report only comparatively little Iron selling, and the combination furnaces are not offering or making any quotations whatever. No word has been received here as to what the attitude of the \$12 furnaces is to be, but the feeling is deepening that it is a misnomer to call them \$12 furnaces any longer. As to the value of Southern Iron, quotations can only be arrived at from the small amounts which are being sold, and these are going on a basis from \$15 to \$15.75, Birmingham, for No. 2 Foundry. It goes without saying that the situation is strong and the outlook for a gradual increase in prices rather than any decline. Freight rate from Hanging Rock district is \$1.10, and from Birmingham \$2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$18.25 to \$19.00
Southern Coke, No. 2.....	17.75 to 18.50
Southern Coke, No. 3.....	17.25 to 18.00
Southern Coke, No. 4.....	16.75 to 17.50
Southern Coke, No. 1 Soft.....	18.25 to 19.00
Southern Coke, No. 2 Soft.....	17.75 to 18.00
Southern Coke, Gray Forge.....	16.75 to 17.50
Southern Coke, Mottled.....	16.75 to 17.50
Ohio Silvery, No. 1.....	21.35 to 21.85
Ohio Silvery, No. 2.....	20.85 to 21.35
Lake Superior Coke, No. 1.....	21.85 to 22.35
Lake Superior Coke, No. 2.....	20.85 to 21.35
Lake Superior Coke, No. 3.....	19.85 to 20.35

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades.....	\$21.75 to \$22.75
Standard Southern Car Wheel, No. 2.....	21.25 to 22.25
Lake Superior Car Wheel and Malleable.....	21.25 to 22.50

**Plates and Bars.**—The general situation shows no change and the market is still strong and active on about the same basis. We quote: Steel Bars, in carload lots, 1.72c., with half extras; same in small lots, 1.85c., with full extras; Iron Bars in carload lots, 1.90c. to 2c., with half extras; same in small lots, 2c. to 2.20c., with full extras; Angles, in carload lots, 2.35c. to 2.50c.; Plates, ¼-inch and heavier, 2.05c.; 3-16-inch, 2.15c.; Sheets, No. 15, 2.85c. to 2.95c.

**Old Material.**—The market, while rather quiet, is still very strong and quotations are practically unchanged. We quote dealers' buying prices, f.o.b. Cin-

cinnati, as follows, No. 1 Wrought and Iron Axles per net tons, others gross tons: No. 1 Wrought Railroad Scrap, \$18.50 to \$19; Iron Axles, \$25 to \$25.50; Steel Rails, rolling mill lengths, \$24 to \$24.25; same, short lengths, \$17 to \$17.50; Car Wheels, \$19 to \$19.50; Cast Machine Scrap, \$14.

### Birmingham.

BIRMINGHAM, ALA., May 5, 1902.

A change in the condition of the market as heretofore reported, and which, at the present writing, remains unchanged, is more than likely to occur by the 15th inst. These letters have stated that there was a restless feeling in some important interests as to quotations; and the futility of making practically paper quotations with no Iron to furnish in evidence of their practical benefit, is more and more being recognized. It is an almost open secret that efforts to hold quotations at figures that bring out no Iron will be abandoned and the market will be governed by the inexorable law of supply and demand. Practically, the quotation on the basis of \$12 represents a desire and what may be. It does not represent what really prevails. The demand for Iron is still materially greater than ability to supply and sales (but limited) were made at enhanced prices. A few important interests are almost at the point of exhaustion as to Iron and have had representatives here to accentuate their condition and to secure as big a slice as possible. No. 2 Foundry is reported as sold at \$16.50 by a reliable interest. Gray Forge sold at \$14.50. Some was offered at \$15, but was not placed. No. 3 Foundry was offered, at close, at \$16, with prospect of sale. No. 4 Foundry was \$14.50, asked. The inquiry was such as to justify the expectation that what little was offered would be absorbed. Some inquiries were on the market for 500 and 1000 ton lots, but they were unsatisfied. There were one or more individual cases where the price bid was extreme, but ended in failure to obtain the Iron. Those who still quote prices on the basis of \$12 for No. 2 Foundry are doing only a nominal business. To sum up, the situation as to spot and nearby deliveries shows no improvement, while the future holds out the inducement of hope.

The Gadsden Furnace is being rehabilitated, and in its rebuilding 250,000 pounds of Plates will be used. It will be modernized and its capacity increased, and will probably be in commission again the latter part of June. The Vanderbilt Furnace, already a compact, well arranged furnace property, is undergoing a system of modernization tending to greater efficiency. The Coosa Furnace, which has been idle for some time, has been purchased by J. M. Elliott and associates, who will practically rebuild it, increasing capacity. These gentlemen own also 22,000 acres of Coal lands, convenient as to location, and a long strip (said to be 15 miles) of the Red Iron Ore, peculiar to the district and running high in Metallic Iron. This is in the "Greasy Cove" district, whose development has been hampered by lack of railroad facilities. It will now be opened up and developed, and its connection with Gadsden by rail will open also the field to Birmingham endeavor. It will be a new source of supply for both Coal and Ore.

There has been a good deal of activity in acreage property in the vicinity of Bessemer, and as the Schulers have indicated a personal interest by their appearance on the field, gossip locates the furnaces, to be, on the purchased property, which, it is said, is admirably located for the purpose. While they are "as dumb as oysters" concerning their plans and intentions it is safe to say "they were climbing upward while their companions slept."

The work on the accessories to the new furnace of the Republic Company, at Thomas, is being pushed fast as effort can. Everything may be ready for a starting up the latter part of this month. It will be a great producer. The situation as to Coal is good. The railroads, warned by past experience, are placing orders and filling their bins for the winter season, "taking time by the forelock." The outside trade, added to the railroad demand, keeps the mines pretty well evened up. In Coke the demand has been and is still greater than local abil-

ity to supply. Considerable orders have been placed outside the district, notably with the Pocahontas district, for Coke, much of which is yet to be received. One hazards nothing in the statement that \$4.50 is a fair representative of price per ton, delivered. With Coke at that price, the quotations for Iron do not seem unreasonably high. It is true that to those favorably situated Coke cost has been and is less; but at a crowded table, not anticipated, the chicken pie sometimes fails in equal distribution to those of equal interest.

J. C. Maken, on the 1st, was installed as president of the Sloss-Sheffield Company, and at once put a quietus on the report that he was only temporarily filling the position and would soon have a successor. E. J. Thomas, Jr., has been appointed auditor to succeed C. H. Schoolar, resigned. The other positions made vacant by resignations have not yet been filled. "It goes without saying," that J. W. McQueen, the present efficient secretary and treasurer, and connected with the company for 12 years, will retain his position. It is current rumor that at the meeting of directors of the Tennessee Company Don Bacon will be formally elected to the presidency.

## Pittsburgh.

(By Telegraph.)

PARK BUILDING, May 7, 1902.

**Pig Iron.**—Prices of Pig Iron are steadily going up and the scarcity of metal is getting worse. Furnaces disclaim responsibility for the high prices, insisting that it is the buyers that are putting the market up. Bessemer Iron has sold for shipment over all of this year, commencing May, at \$20 at furnace, while Iron for June, July and August has sold at \$20.75 at furnace. It is intimated that \$21 at furnace has been done for first quarter. Gray Forge is \$19.50 to \$20, Pittsburgh. Southern Forge is being offered at \$19.25 here, equal to \$15.15 at furnace in Birmingham district. No. 2 Foundry Iron has sold at \$21 at Valley furnace. We quote Bessemer at \$20 to \$21 at furnace, but it is doubtful whether any Iron could be had at the lower figure. Forge is \$19.50 to \$19.75, and No. 2 Foundry \$21.25 to \$21.75, Pittsburgh. We note sales of about 6000 tons of Bessemer at prices ranging from \$20 up to \$20.75 at furnace.

**Billets.**—Hardly enough Steel is being sold to test the market. Small lots of domestic Billets bring anywhere from \$32 to \$33 and \$34. Foreign Sheet Bars have been sold at \$33.50 to \$34 for delivery west of Pittsburgh. It is said that the few Sheet mills that have regular sources of supply of Steel have been able to accumulate fairly large stocks of Sheet Bars and Billets, sufficient to run them for some months. A good deal of foreign Steel is being offered in this market in the shape of Billets and Sheet Bars.

**Muck Bar.**—Standard grades of Muck Bar for prompt shipment would readily bring \$35, Pittsburgh. Some sellers are quoting as high as \$35.50.

**Skelp.**—Grooved Iron Skelp has sold at 2.25c., Pittsburgh, and this price seems to be the minimum of the market to-day.

(By Mail.)

The labor situation in the Pittsburgh district, like almost every other place, was seriously disturbed on May 1. The core makers and molders in a number of the foundries have gone out, while other craftsmen, such as plumbers, carpenters and bricklayers, are on strike, with the result that a good deal of work is tied up. A formal demand has been made on the blast furnace operators in the Pittsburgh and Valley districts for an eight-hour day, commencing June 1, with the present rate of wage. It looks as though there might be more or less trouble with labor all this summer. At this time when the weather is so warm the men would about as soon be idle as working. As to what action will be taken on the demand of blast furnace labor cannot be foretold, but if the furnace owners maintain their present position in the matter the men will not get an eight-hour day. Very little is being done in Pig Iron, for the reason that there is not much Iron to be had, while on the other hand consumers are pretty well covered for months ahead. A reported purchase of 10,000 tons of

Bessemer by the Cambria Steel Company has been officially denied. For small lots of Iron premiums are being paid. There is not much doing in domestic Steel, but a good deal of foreign is being offered on the market, both in Billets and Sheet Bars. There is nothing of special interest to note in Finished Iron and Steel, demand in April having fallen off a good deal as compared with the two previous months. Large consumers are covered and are specifying on their contracts, which will keep the mills filled up for months.

**Rails.**—The Ohio Works of the Carnegie Steel Company, at Youngstown, have gone on Rails, and are running on a large order for the Big Four Road. The Canadian Pacific bought some time ago 5000 tons of foreign Rails, and is in the market again for a like amount. There has been some inquiry for Rails for next year's shipment, but no actual tonnage has yet been placed. We can state officially that there will be no advance in the price of Rails. We quote at \$28, at mill, for Standard Sections. Light Section Rails bring very high prices.

**Muck Bar.**—It has been predicted that Muck Bar will go to \$40 a ton. We quote the best grades of Muck Bar for rerolling into Skelp and other material at \$34.50 to \$35 a ton, Pittsburgh. It is possible some makes of Muck Bar, not so favorably known, might be had at \$34.

**Ferromanganese.**—We quote foreign brands of Ferro at \$48 to \$49, Pittsburgh. Very little domestic is being offered.

**Plates.**—It was erroneously reported last week that the price of Plates had been officially advanced \$2 a ton. The Plate Association will meet soon, but it is safe to say there will be no advance in prices. Tonnage in Plates is heavy, and it is said some large contracts have been placed for delivery next year. We quote: Tank Plate, ¼-inch thick and up to 100 inches in width, 1.60c. at mill, Pittsburgh; Flange and Boiler Steel, 1.70c.; Marine, Ordinary Fire Box, American Boiler Manufacturers' Association specifications, 1.80c.; Still Bottom Steel, 1.90c.; Locomotive Fire Box, not less than 2.10c., and it ranges in price to 3c. Plate more than 100 inches wide, 5c. extra per 100 lbs. Plate 3-16 inch in thickness, \$2 extra; gauges Nos. 7 and 8, \$3 extra; No. 9, \$5 extra. These quotations are based on carload lots, with 5c. extra for less than carload lots; terms, net cash in 30 days. Small lots of Plates from store are sold on the basis of 1.70c. to 1.75c. for Tank, with the usual advances for the higher grades.

**Spelter.**—There is a good deal of inquiry and some difficulty in getting prompt delivery of Spelter. We quote best grades at 4.27½c. to 4.30c., Pittsburgh.

**Rods.**—The Rod market is a good deal like Billets, Rods being very scarce and bringing high prices for prompt shipment. We quote Bessemer Rods at \$37 to \$38, depending on size of the order and deliveries wanted.

**Structural Material.**—A phenomenal tonnage is being placed. The American Bridge Company have taken heavy contracts, while McClintic-Marshall, Columbia Bridge and Fort Pitt Bridge Company have also recently taken large contracts. It is safe to say that in the past ten days fully 20,000 tons of material, mostly for work in the Pittsburgh district, have been contracted for, and many other large jobs are in sight. Some large contracts for Shapes have been placed for delivery next year, as the mills could not make deliveries this year. Prices are merely nominal, prompt Beams and other shapes bringing 2½c. and higher. Official prices are as follows: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inches, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.50c., half extras, at mill; Universal and Sheared Plates, 1.60c. All above prices are f.o.b. Pittsburgh.

**Sheets.**—The Sheet market is very strong, and some good sized orders for Black Sheets are being placed. Demand for Galvanized is not as heavy as some time ago. We quote No. 27 Black Sheets, box annealed, one pass through cold rolls, at 3c., and No. 28 at 3.10c. For large contracts and extended delivery No. 27 could probably be bought at 2.95c., and No. 28 at 3.05c. From



store, small lots of No. 27 bring 3.15c. to 3.20c., and No. 28, 3.20c. to 3.25c. We quote Galvanized Sheets at 70, 10 and 5 off in carloads and 70 and 5 in small lots. The leading Sheet interest, and also several other mills, now quote Galvanized at net prices. All above prices are f.o.b. maker's mill.

**Hoops and Bands.**—We quote Hoops, Bessemer stock, at 1.90c. for 250-ton lots and over and 2c. in less quantities. Bands are 1.60c. for Bessemer stock, 12 gauge and heavier, with an advance of \$2 for Open Hearth.

**Merchant Steel.**—While most of the large contracts were placed some time ago, current tonnage is large and the market is very strong. We quote: Tire Steel, 1.80c. to 2c.; Open Hearth Spring, 2.25c. to 2.50c.; Hammered Lay Steel, 3.75c. to 4c.; Cold Rolled and Cold Drawn Shafting, 50 per cent. off in carloads and 45 per cent. in less than carloads in Basing Territory; Tool Steel, 6½c. to 7c. for ordinary grades, 12c. and upward for special grades, all f.o.b. at mill.

**Skelp.**—There is a heavy demand for both Iron and Steel Skelp, and, as the supply seems limited, high prices are being paid. We quote Grooved Iron Skelp at 2.10c. to 2.15c. and Sheared at 2.15c. to 2.25c. Steel Skelp brings still higher prices. We quote Grooved at 2.25c. and Sheared at 2.35c. We note a sale of about 1500 tons of Grooved Steel Skelp at 2.25c., Pittsburgh.

**Boiler Tubes.**—Current tonnage is very heavy and the mills are from two to three months behind on orders. Demand for Boiler Tubes at the present time is larger than ever before, the boiler and locomotive shops being full of work and large buyers. Discounts for small lots are as follows:

Boiler Tubes.	Up to 22 feet. Per cent.
Steel.	
1 to 1½ inch, inclusive.....	45
2¾ inch to 5 inch, inclusive.....	63½
1¾ inch to 2¾ inch and 6 inch to 13 inch, inclusive..	58
Iron.	
1 inch to 1½ inch and 2½ inch.....	39
1¾ inch to 2½ inch.....	38
2¾ inch to 13 inch.....	48

The mills quote lower prices than the above to the jobbing trade for large lots.

**Merchant Pipe.**—Demand is very heavy and the tone of the market is firm. The independent Pipe mills are pretty well filled up and there is less cutting in prices than for some time. Pittsburgh basing discounts for carloads are as follows:

Merchant Pipe.	Black. Per cent.	Galvd. Percent.
¼ to ½ inch, inclusive.....	60	48
¾ to 12 inch, inclusive.....	67	55

**Scrap.**—We note a continued heavy demand for all kinds of Scrap, particularly for stock for open hearth purposes. We quote No. 1 Wrought Iron Scrap at \$20 in net tons; Heavy Melting Stock, \$19.50 to \$20 in gross tons. Other kinds of Scrap are proportionately high in price.

**Coke.**—Figures given by the *Courier* show the output of Coke in the Connellsville region last week to have been nearly 225,000 tons. There is still some complaint about shortage of cars. Some contracts for both Furnace and Foundry Coke have been made for shipment over last half of the year. We quote strictly Connellsville Furnace Coke at \$2.25 and 72-hour Foundry \$2.75 to \$3 a ton. Main Line Coke is being offered on the basis of about \$2.15 for Furnace and \$2.60 to \$2.65 for Foundry.

Naylor & Co. of New York, Iron and Steel merchants and importers, have opened an office in Room 910, Frick Building, Pittsburgh, with A. Krum in charge.

## German Iron Market.

ESSEN, April 20, 1902.

No very important changes have taken place in the German Iron and Steel market since our last report. The large Steel works, generally, are so well employed that they are running to full capacity. This is due almost entirely to the heavy export trade, which lately has placed Germany in the first rank of the countries supplying the world with Iron. Above all, the increased exports are due to the better condition of the American Iron market. Even more important than the fact that

America has purchased German Pig Iron, Steel and Structural Material is the fact that the works in the United States have ceased to be competitors in neutral markets. Our requirements from the home market, too, have grown, although now there is less buying than there was during the first months of the year. However, all the works are receiving specifications on old orders so freely that regular running is assured for weeks and months to come. In the last few weeks prices have not been maintained at the advance, still they leave at least a modest profit to the manufacturers.

The Siegen Iron Ore Syndicate have reduced the price on Spathic Ore from 11 to 10.80 marks per ton, and has lowered the price on Roasted Spathic Ore from 16 to 15 marks, hoping to induce the furnaces to place new orders. Thus far, however, this course has met with only moderate success. The principal supply of Ore of the German furnaces comes from Sweden, Spain and Lorraine. So far as the two countries first named are concerned, the furnaces have long time sliding scale contracts. As for the Lorraine Minette, the mines are now nearly all in the possession of furnace plants, and sales are therefore very rarely made.

There has been more buying of Pig Iron on the part of home dealers and consumers. Stocks in Rhenish Westphalia have declined about 9000 tons in March, and are now equal to about one month's production. Prices are as follows: 10 to 12 per cent. Spiegeleisen, 72 marks; Special Mill Iron, 60 marks, f.o.b. Siegen; Bessemer Pig, 62 to 64 marks; Basic Bessemer Pig, 57.40 to 58 marks; No. 3 Luxemburg Foundry, 48 marks; No. 1 German Foundry and Hematite, 66 to 67 marks; No. 3 German Foundry, 62 to 63 marks, all f.o.b. furnace. No. 3 English Pig Iron is quoted at 65 to 67 marks, f.o.b. Ruhrort.

In the Billet trade large contracts have been placed at an advance of 5 to 7.50 marks per ton, and as the result of the better employment of the rolling mills specification are coming in very well. The demand for export has lessened since the works are asking 88 to 89 marks per ton for Billets. In the home market Basic Bessemer Ingots are quoted at 82.50 marks; Blooms, 87.50 marks; Billets, 95 marks, and Slabs, 97.50 marks per ton, f.o.b. Ruhrort, Oberhausen, Dortmund or Diedenhofen.

In Finished Iron and Steel the amount of work is quite satisfactory, and some large orders have been placed for Wrought Iron at prices which, however, are not particularly remunerative. For ordinary Bar Iron 125 to 127.50 marks per ton, f.o.b. mills, is being asked. Steel Bars, on which the official price is still 110 marks, cannot be bought at less than 115 marks. In the Beam trade the opening of the building season has brought about considerable activity, and the stocks at the works, which have accumulated during the bad times, are expected to disappear pretty soon. Prices are still unchanged at 105 marks per ton, f.o.b. Burbach. The Band and Hoop trade is active, with quotations at 127 to 132.50 marks. Skelp is not doing particularly well. Before the Sheet Mill Syndicate were formed so many orders were taken in that the mills have employment for months to come. The syndicate price has been made 145 marks, but it is quite easy to cover from second hands at 138 to 140 marks. The Pipe mills have put down the discount so that the price has been advanced by about 10 marks per ton. In the Wire business conditions have further developed in a favorable way. Wire Rods are almost scarce for the home market, because before the syndicate was formed large export sales were made. The domestic price for the current quarter is 130 to 132.50 marks, according to magnitude of order, and what supply there has been has been rapidly taken up. For export 15 marks less is being quoted. Drawn Wire is 140 to 145 marks for the home trade, and 125 to 128 marks for export. The demand for Wire Nails is very active, and the price for jobbers is now 15.75 marks per 100 kilos.

A good deal of work has been taken for railroad requirements. Thus four of the large works secured an order for 20,000 tons of Rails for a road in your Southern States, and further orders are in sight. For street Rails new orders are gradually coming in. Mine Rails

and light Agricultural Rails are 102.50 to 105 marks; Heavy Rails, 120 to 125 marks; Girder Rails for tramways, 135 to 140 marks. The locomotive works are well employed for a considerable time to come, but other machine shops and boiler makers frequently complain of shortage of work.

## New York.

NEW YORK, May 7, 1902.

**Pig Iron.**—A feature of the market is that quite a number of foundries, particularly in New England, find that their consumption is larger than expected, and are being forced to cover their additional requirements at the market price. We quote, for summer delivery, Northern Iron, at tidewater, No. 1 X, nominal, \$21.50 to \$22; No. 2 X, \$19.50 to \$20; No. 2 Plain, \$19 to \$19.50; Tennessee and Alabama brands are as follows: No. 1 Foundry, \$19.50 to \$20.50; No. 2 Foundry, \$18.75 to \$19.25; No. 3 Foundry, \$17.75 to \$18.25.

**Cast Iron Pipe.**—Although one of the leading Eastern shops is occasionally making low bids, the market continues very strong. A notable fact is that the smaller gas companies and municipalities are buying relatively large quantities for extended delivery. Among the contracts coming up is one for about 500 tons for the city of New York.

**Steel Rails.**—We hear of the selling of small lots of foreign Steel Rails, the quantities ranging from 1500 to 3000 tons.

**Finished Iron and Steel.**—No large contracts for Structural Material have been reported for this section during the past week. Foreign Structural Material being offered, apparently it can be laid down at tidewater, duty paid, at about 1.70c. per lb. for fairly prompt shipment. The contemplated meeting of the manufacturers of Steel Plates has been postponed. We quote at tidewater: Beams, Channels and Zees, 2c. to 2.25c.; Angles, 1.75c. to 2.25c.; Tees, 1.95c. to 2.25c.; Bulb Angles and Deck Beams, 2.10c. to 2.25c.; Sheared Steel Plates are 1.95c. to 2c. for Tank, 2c. to 2.15c. for Flange, 2.15c. to 2.25c. for Fire Box. Refined Bars are 1.90c. to 2c.; Soft Steel Bars, 1.80c. to 1.85c.

Francis G. Gorham, dealer in all kinds of Railway Material, has removed his office from 32 Broadway to 136 Liberty street. Mr. Gorham continues to represent Henry Levis & Co. of Philadelphia.

## Metal Market.

NEW YORK, May 7, 1902.

**Pig Tin.**—The market has held fairly steady at the high prices. Business is not heavy, as large consumers are still supplied through old contracts which were taken when prices were in the vicinity of 23c. It was the large purchases made a number of weeks ago that occasioned the heavy deliveries during the month of April, which were the largest on record, amounting to 3300 tons. The market closed a shade firmer on spot to-day at 28.40c. bid. May was 28¼c. to 28½c., June 28c. to 28¼c. The London market has also been held firmly, spot being quoted to-day £131 12s. 6d., and futures £128 5s. Statistics for Europe and the United States, compiled by the New York Metal Exchange, show:

Total visible supply April 30, 1902.....	Tons. 15,596
Against visible supply March 31, 1902.....	18,131
Against visible supply April 30, 1901.....	16,128

**Copper.**—Business for consumption is very light, but on 'Change there was a firmer feeling, with transactions of several hundred tons of Standard and Electrolytic at higher figures. Sales of Electrolytic made at the Metal Exchange to-day include 50,000 lbs., August delivery, at 11.70c., and an equal amount of December at the same price. The closing quotation for spot Standard to-day was 11c. to 11.35c. Lake is quoted 11½c. to 12.10c.; Electrolytic is quoted, spot and May, 11½c. bid; June and July, 11.60c. bid, and Casting is quoted 11½c. to 11¾c. Exports during the month of April fell off considerably. They amounted to 16,275 tons, against

20,015 tons for the month of April last year. The total exports for the first four months of this year amount to 65,765 tons, against 28,987 tons for the corresponding period of last year. A prominent factor in the Copper trade stated that the outlook this month indicates a further shrinkage in the exportation. "The heavy exports of the first four months of this year were made as a result of heavy purchases ranging during the close of last year, when Copper was selling here at 11c. or less. The production in this country, Mexico and British North America is rapidly increasing, and if consumption does not increase somewhat both here and abroad the outlook will grow worse." During the last two weeks one of the large Lake companies have been looking about and testing the market for further sales to home consumers. It is stated in the trade that the effort did not terminate successfully, as most of the consumers are still under engagement. It is even stated that some consumers have a guarantee contract from a large producer covering the balance of this year. It is said that the Lake company, now looking about to dispose of future product, sold heavily in Europe at 11c., delivered there. The London market was not very active during the week. The market was firm, however, and prices regained their loss of a week ago. At the close to-day the cables named £53 5s. for both spot and futures. Best Selected advanced 10 shillings to £56 10s.

**Pig Lead.**—Is without change, dull and uninteresting. The Smelting & Refining Company still quote 4.12½c. for Desilverized, strictly spot, and 4.10c., 15 days, New York. London has declined slightly to £11 12s. 6d.

**Spelter.**—The market is somewhat easier. Spot is quoted here 4.40c., May, 4.35c., and June 4.32½c. St. Louis quotes 4.12½c. and London advanced to £18 6s. 3d.

**Antimony.**—Is unchanged. Hallett's is quoted 8c. to 8¼c.; Cookson's, 10¼c., and outside brands, 7½c.

**Nickel.**—The situation is unchanged. Ton lots are quoted at 50c.

**Quicksilver.**—Prices are on a basis of \$48 per flask of 76½ lbs. in lots of 56 flasks or more.

**Tin Plates.**—The market is unchanged. The American Tin Plate Company are quoting for delivery until October 1 on a basis of \$4.19 per box of standard 100-lb. Cokes, f.o.b. New York, or \$4, f.o.b. Pittsburgh district. The English market declined 1½ pence to 13s. 6d.

## Iron and Industrial Stocks.

Iron and steel stocks generally suffered with the rest of the stock market from the Webb-Mayer developments and from the spasmodic scarcity of money. Conspicuous declines took place in Locomotive preferred. There was also quite a sharp decline in Colorado Fuel stock, which fell from 108¾ on Thursday to a minimum of 99½ on Saturday. Tuesday, however, brought a general recovery.

At a special meeting of the stockholders of the Pittsburgh Coal Company of Pittsburgh, held in New Jersey last week, it was decided to issue bonds to the extent of \$6,000,000, to take up the floating debts of the company, contracted in the purchase of additional coal properties. The new bonds have been ordered printed and will be ready for turning over to the Union Trust Company, Pittsburgh, in a few days. The latter company will finance the loan on a basis of par value. Heavy shipments of coal by the company to the lake ports for movement to the Northwest have been started, and the only reason that the shipments do not form a record-breaking affair in the history of the corporation is because the railroad companies are unable to supply cars fast enough. In spite of this, however, the company hope to show a great increase in tonnage during the present season.

The Crucible Steel Company of America, at Pittsburgh, will in a few months complete their second year, and surplus earnings at that time are expected to show 20 per cent. on the \$25,000,000 of common stock, as last year 7 per cent. was reported and 13 per cent. is anticipated this fiscal year.

At a meeting of the William Cramp & Sons Ship & Engine Building Company in Philadelphia, May 1, au-



thority was granted to the officers of the corporation to expend \$4,000,000 for improvements now necessary at the yard, owing to the demands for the construction of larger vessels. More space and tools are necessary for the proper development of the shipyard, and the stockholders were called together to authorize the issue.

**Dividends.**—The American Radiator Company have declared a dividend of 1¼ per cent. upon their preferred stock, payable May 15.

The Ashton Valve Company have declared a regular quarterly dividend of 1½ per cent., payable May 15.

## The New York Machinery Market.

NEW YORK, May 7, 1902.

General market conditions remain entirely unchanged. A good demand continues in small lots. No new inquiries of special size were reported. In the machine tool trade it was expected that the Lackawanna Railroad would close on the list which they have had out for some weeks. This has not been done. The New York, New Haven & Hartford Railroad bought a few tools for their marine repair shops at Weehawken, N. J. They have not arrived at a decision as yet on the large list of tools for this shop, which has been out for a number of months. The New York Central purchased two large Shaw cranes for the West Shore locomotive repair shops at New Durham, but have not issued a list of machine tools. They also purchased a 150 kw. generating set from McClave, Hamilton & Rimmer, for operating the New Durham cranes.

Deliveries on all classes of heavy machine tools are still well into the future. Punches and shears are quoted from five to six months off, according to size. Heavy lathes run about three months off, but sizes below 24 inches swing can be had quite promptly—generally June delivery. Planers and boring mills are still as scarce as they have been for many months. In boring mills of the smaller and medium sizes, luck often figures in the matter of delivery. The prominent builders are building these machines in pretty large sized lots nowadays, and an order entered to-day may just catch the last machine of a lot about to be finished, while the next order will have to head the list on the next lot and wait from three to four months for delivery. Milling machines are enjoying an excellent demand and certain builders are making extra efforts in the direction of the heavier sizes. This branch of the industry can stand considerable development, as the educational work which milling machine builders have been carrying on is resulting in a growing demand for very heavy machines. We hear of a certain type of screw machine, which is now being put through in lots of upward of 50 and for which orders are being booked four months in advance. One New York machinery merchant obtained orders last month for over 40 machines of this type.

Prices are firm and unchanged. A prominent merchant said with a smile that the only change he had been notified of was a 2 per cent. advance scheduled to take place June 1. The general impression of the trade is that no changes of any significance will be made for some time.

J. P. Williams, 309 Industrial Trust Building, Providence, R. I., has completed the sale of the machine tools owned by the A. B. Pitkin Machinery Company of Providence to the C. C. Wormer Machinery Company of Detroit, Mich.

The new plant of the Ball Engine Company of Erie, Pa., will consist of a machine shop, 136 x 200 feet, with power building, 60 x 80 feet; erecting shop, 76 x 200 feet, equipped with a 30-ton traveling crane, and two smaller buildings, which will have saw tooth roofs and will be equipped with 5-ton cranes.

Extensive additions are being built to the plant of the Pratt Chuck Company, manufacturers of drill chucks and seamless steel ferrules, Frankfort, N. Y. There is to be a new power house to be equipped with larger engine and boiler and an addition to the machinery equipment.

The Paxtang Electric Company, Harrisburg, Pa., re-

cently incorporated with a capital stock of \$400,000, are having plans and specifications prepared for a new power plant. The equipment has been purchased. Christian W. Lynch is in charge of the new work.

L. L. Smith, president, Light Commission, Canandaigua, N. Y., informs us that he would be pleased to receive estimates for an electric plant of about 150 arc lights and 5000 incandescent lights and engines and boilers of about 450 horse-power.

The Standard Oil Company have ordered three large fuel economizers from the Green Fuel Company of 74 Cortlandt street for installation in their Eclipse Works at Franklin, Pa. They will be used in connection with their oil stills as a result of an experiment which they have been making with an economizer.

The Pennsylvania Steel Company of Steelton, Pa., have ordered a 3000 horse-power feed water heater from Charles H. Paine, 85 Liberty street. The heaters will be of the Wainwright even flow type built by the Taunton Locomotive Mfg. Company of Taunton, Mass.

William Ivins, president of the Ivins, Dietz & Metzger Company, carpet manufacturers, of Philadelphia, confirms the report that the concern are to add a new building to their works. He states that plans and specifications are now being prepared, but is not ready to state what equipment will be required.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, until May 13, to furnish at the navy yard, Pensacola, Fla., a quantity of machinery and tools. Blank proposals will be furnished upon application to the navy yard, Pensacola, Fla., or by A. S. Kenny, paymaster general, United States Navy.

## Chicago Pneumatic Tool Company Absorb International Company.

CHICAGO, ILL., May 7, 1902.—(By Telegraph.)—A London cable announcing the conditional purchase of the International Pneumatic Tool Company of London by the Chicago Pneumatic Tool Company through J. W. Duntley, president, is confirmed by officials of the Chicago Company. The option on the International Company was obtained some time since, and it has now been decided to close the option, subject to the approval of the Chicago directors and stockholders. J. W. Duntley, accompanied by E. N. Hurley, ex-president of the Standard Company, absorbed by the Chicago Pneumatic Tool Company some time since, sail to-day from London for New York. The exact amount involved in the purchase is not made public as yet. The International Company are manufacturing tools for the European trade under the former Standard Pneumatic Tool Company's patents.

## April Fluctuations in Iron Stocks.

The following sales show the fluctuations in the quotations of the stocks of iron and steel companies:

Cap'l issued.		Sales.	High-Date.	Low-Date.
			est. April	est. April
\$10,000,000	Am. Bicycle Co., com.	93,400	8½	23 37½
20,000,000	Am. Bicycle Co., pref.	63,700	26½	23 17½
10,000,000	Am. Bicycle Co., bonds	744,500	73	18 59
29,000,000	Am. Car & F'dry, com.	66,600	31¾	1 28¼
29,000,000	Am. Car & F'dry, pref.	14,500	91½	9 88½
	Am. Locomotive, pref.	126,000	100¼	29 92
15,000,000	Bethlehem Steel		25	26 23¾
45,000,000	Cambria Steel	32,000	25	24 95
17,000,000	Col. Fuel & Iron	838,100	110½	24 95
24,410,000	Crucible Steel, com.			
24,399,500	Crucible Steel, pref.			
1,975,000	Diamond State Steel	2,500	17½	15 13½
15,000,000	Inter. Pump, com.	3,500	55½	17 52½
8,850,000	Inter. Pump, pref.	1,300	93	24 90
11,000,000	International Silver	51,000	19¼	18 10
10,750,000	Pa., new, com., Phila.	1,800	43¾	4 38¾
16,500,000	Pa., new, pref., Phila.	6,200	93¾	11 88
12,500,000	Pressed Steel, com.	12,500	46½	29 40
12,500,000	Pressed Steel, pref.	25,000	89	28 83
27,191,000	Rep. Iron & St., com.	87,500	20	24 17
20,306,900	Rep. Iron & St., pref.	32,500	76	25 72½
7,500,000	Sloss-Shef. S. & L., com.	1,000	33	23 32
6,700,000	Sloss-Shef. S. & L., pref.	1,000	83	2 81¾
20,000,000	Tenn. Coal & Iron	216,000	74½	24 64½
1,500,000	Tidewater Steel	500	67½	11 6½
510,361,500	U. S. Steel Co., com.	519,000	43¾	25 40¾
508,511,200	U. S. Steel Co., pref.	385,000	94¾	25 92¾
1,500,000	Warwick I. & S.	3,000	4½	2 4½

Jos. B. Dickson, formerly of the Dickson Mfg. Company of Scranton, has become a director of the Tennessee Coal, Iron & Railroad Company.

## The United States Steel Corporation.

### Statistics of Production.

At a meeting of the Board of Directors of the United States Steel Corporation, C. M. Schwab, the president, submitted the following statistics of the production of the constituent companies for the first fiscal year, ending March 31, 1902:

Ore Mined.	
	Tons.
From Marquette Range.....	1,336,215
From Menominee Range.....	1,951,160
From Gogebic Range.....	1,810,792
From Vermillion Range.....	1,872,214
From Mesaba Range.....	6,356,324
Total.....	13,326,705
Coke manufactured.....	9,079,142

Furnace Product.	
Pig iron.....	6,961,543
Spiegel.....	134,064
Ferromanganese.....	56,514
Total (equal to 45 per cent. of total production in United States).....	7,152,121

This compares as follows with the production of the leading countries:

	Tons.
United States, 1901.....	15,878,354
Great Britain, 1900.....	8,959,691
Germany, 1900.....	8,520,390
France, 1900.....	2,699,494

Ingot Production.	
Bessemer.....	6,262,202
Open hearth.....	2,772,378
Total (equal to 67 per cent. of total production in United States).....	9,034,580

The production of the leading countries was as follows:

	Tons.
United States, 1901.....	13,369,613
Great Britain, 1901.....	4,850,000
Germany, 1901.....	6,394,222
France, 1901.....	1,465,071

Finished Products.	
Rolls.....	1,675,628
Blooms, billets and slabs (for shipment).....	2,481,227
Plates.....	742,508
Merchant steel, shapes, bars, hoops and bars.....	1,236,343
Sheets.....	415,299
Tin plate.....	404,746
Wire and wire products.....	1,078,838
Tubes and pipes.....	693,655
Axles and forgings.....	90,659
Angle bars and joints.....	127,582
Structural work (Bridge Company).....	489,506
Miscellaneous.....	50,877

Volume of Business.			
Steel manufacturing properties—	Tons.	Selling value.	Manufacturing cost.
Shipments, (including shipments between constituent companies).....	10,023,837	\$410,643,625.39	\$315,662,881.63
Coke shipments (including coke manufactured and coke purchased for re-sale).....	10,970,768	18,936,301.26	12,453,346.17

Transportation Properties.	
Gross earnings.....	\$29,511,012.86
Operating expenses and taxes.....	16,431,006.79

Maintenance.	
The outlays for repairs, maintenance and extraordinary renewals during the year were as follows:	
Steel making properties.....	\$19,208,335.54
Coke properties.....	881,763.45
Transportation properties.....	4,451,590.15
Total.....	\$24,541,689.12

NOTE.—In case of the mining properties the outlays for repairs are so closely allied to operating charges that no separation has been attempted. It is, therefore, quite impossible to give the amount of these expenses.

Freights Paid.	
The freight charges paid during the year by producing and manufacturing companies to transportation companies, not including charges on ore paid to our own railroads and steamship lines, aggregated.....	\$54,147,567.85

Employees.	
Average number of employees in service during the year.....	158,263
Total wages paid.....	\$112,829,198.41

## The Dillon-Griswold Wire Company.

(By Telegraph.)

CHICAGO, ILL., May 6, 1902.—At a recent meeting of the Dillon-Griswold Wire Company, Sterling, Ill., W. M. Dillon, president and general manager, resigned, C. M. Wicker of New York City being elected to succeed him. While Mr. Dillon will no longer be connected with the active management of the mill, he retains his holdings in the company and is still owner of the wire factory at Rock Falls. The wire mill at Sterling will resume as soon as the much needed material, now in transit from Pittsburgh, arrives. The time of the resumption of work in the rod mill is dependent somewhat upon the relative price of billets and rods. The wire mill is to be run at its full capacity, but no increase is expected at the present time. Mr. Wicker, the new president, is interested in many Eastern enterprises, among them being the Worcester Traction Company, the North Shore Traction Company, the Fort Worth & Rio Grande Railroad Company and the Washington Savings Bank. A report that the Sterling mill had been absorbed by the United States Steel Corporation proves to have been unfounded and the entrance of New York capital into the enterprise will set at rest any such rumors.

**Seaman-Sleeth Company.**—The Seaman-Sleeth Company, operating the Phoenix Roll Works of Pittsburgh, are making some large additions and improvements in their plant. A second electric plant is being installed, to develop 250 horse-power, and provided with Westinghouse equipment. Three 80-ton jib cranes are being torn out and in their place are being installed two 60-ton Morgan electric traveling cranes. This is being done in No. 2 Foundry, to which an extension of 90 feet is being added, making it 240 feet long. In No. 1 Foundry seven jib cranes are being torn out and will be replaced by two 20-ton Morgan electric cranes on runways 320 feet long. Other extensive improvements are being made, and it is the intention of the company to drive all blowers and other equipment where possible by electricity instead of by steam, as heretofore. These improvements will facilitate very much the handling and getting out of material and will increase the capacity of the works in the manufacture of rolls, which they make exclusively, fully 50 per cent. The business of the Seaman-Sleeth Company was established in Pittsburgh in 1870, and the capacity of the plant has been increased many times since its first inception. The officers of the concern are J. S. Seaman, president; Robert Sleeth, vice-president; James L. Morrow, secretary and treasurer, and Charles B. Seaman, superintendent.

**A New Crucible Steel Plant.**—Reuben Miller, Jr., of Pittsburgh, who recently resigned as treasurer of the Crucible Steel Company of America, intends to again actively engage in the manufacture of crucible and other fine steels. It is the intention of Mr. Miller to spend the summer at his new cottage, which he is building in the Muskoka district in Canada, but upon his return to Pittsburgh in the fall he will actively take up the matter of building a crucible steel plant. No plans have yet been drawn for the new works, nor have any contracts been let, but the plant will be located in the Pittsburgh district. Reuben Miller, Sr., who has retired from active business, will be connected with the new enterprise in a financial and advisory capacity.

The annual convention of the Amalgamated Association, which had been in session in Wheeling for two weeks, adjourned on May 2. Columbus, Ohio, was selected as the place for the next annual convention of the association, to be held in May, 1903. All the national officers were re-elected, as follows: Theodore J. Shaffer, president; M. F. Tighe, vice-president, and John Williams, secretary. The following vice-presidents were chosen: Second district, Llewellyn Lewis, Martin's Ferry; third, W. E. Egan, Covington, Ky.; fifth, P. J. McArdle, Terre Haute; seventh, William Jenkins, Gate City, Ala.



### The Carnegie Steel Company Win the Mixer Case.

By a decision of the United States Supreme Court the Circuit Court of Appeals of the Western District of Pennsylvania has been reversed in the case of the Carnegie Steel Company against the Cambria Iron Company, an action over the infringement of the Jones mixer patent, covering the great molten iron mixers now so extensively employed in making Bessemer steel. Owing to the magnitude of the case, the interests involved and the various contests growing out of the litigation, its final determination makes the decision a prominent one. The Supreme Court finds the Cambria Company liable, and remands the case to the Circuit Court for an accounting. The litigation in this suit dates from 1897. It has been contested in courts in Philadelphia and Pittsburgh, the highest legal talent being employed on both sides, making the case famous in legal annals. The case was argued about two years ago before the Supreme Court at Washington, and the fact that the justices of that high bench ordered a reargument before its own body was evidence that the points at issue were of the greatest importance, such action being almost unprecedented. The decision was not unanimous, the chief justice and three associates dissenting.

C. M. Schwab, president, and a large party of other officials of the United States Steel Corporation arrived in Pittsburgh on Wednesday morning, May 7, for the purpose of making an official inspection of the various plants of the United States Steel Corporation in the Pittsburgh district and Central West. On Wednesday the Edgar Thomson Steel Works, Rankin blast furnaces, Duquesne Steel Works, W. Dewees Wood and National Tube Company mills were visited. It is intended to spend the entire day on Thursday at the Homestead Steel Works. On Friday, plants along the Allegheny River, consisting of Shoenberger Works, Upper and Lower Union Mills, William Clark Works, Lucy Furnaces and Isabella Furnaces at Etna will be inspected. Saturday will be spent in the offices of the Carnegie Steel Company, in Pittsburgh, and on Monday the entire party will visit the plants in the Mahoning and Shenango valleys, then go to Chicago and Indiana districts, finally to the ore regions. The inspection trip is expected to last from ten days to two weeks, and is being taken for the purpose of determining just what improvements are to be made to existing plants and what new works are to be built by the constituent companies of the steel corporation. The party will be accompanied from Pittsburgh by W. E. Corey, president, and other officials of the Carnegie Steel Company.

A. McCordie, president of the Illinois Car & Equipment Company, Hegewisch, Chicago, is in New York to complete the deal by which that company will be consolidated with the Pressed Steel Car Company. The Western Steel Car & Foundry Company have been incorporated with a capital stock of \$1,250,000, to lease the Hegewisch plant from the English bondholders who are now in possession, and this company, in turn, will sell a majority of their stock to the Pressed Steel Car Company. The Hegewisch plant, which has a capacity of about 30 cars per day, will probably be considerably enlarged, and will become the Western repair shops of the Pressed Steel Car Company.

John S. Gibson of Newark, N. J., has been appointed receiver for the Carteret Steel Company, 150 Broadway, New York City, whose plant is located at Hackettstown, N. J.

The bar iron scale, which is arranged bimonthly, will likely be fixed up next week at a meeting to be held in Youngstown, Ohio, between representatives of the Amalgamated Association and James H. Nutt, labor commissioner for the Republic Iron & Steel Company. It is not unlikely the men will receive an advance in wages for May and June, as the average price of ship-

ments of iron bars for March and April is thought to be higher than for the two preceding months.

### Conveying System at the St. Clair Works.

The McClintic-Marshall Construction Company of Pittsburgh, builders of iron and steel construction work of all kinds, have received a contract from the St. Clair Furnace Company for a great steel railroad trestle, which is to extend from the level of the terminal railroad system of the St. Clair works at Clairton over the steel ore storage bins, from which the furnaces are to be directly fed with iron ore. The trestle will be 360 feet long, with 12 separate spans. Extending from the trestle overhead will be a number of tracks, from which the ore in steel hopper railroad cars will be dumped to the steel bins. These bins will discharge the ore into small hoppers, which will be carried by the conveying system of the Brown Hoisting Machinery Company of Cleveland, Ohio, to the furnaces. The entire ore storage and conveying plant will be installed by the McClintic-Marshall Company, who closed part of the contract some time ago. This plant will require in construction about 1500 tons of structural steel. Directly connected with this ore storage and conveying system will be the terminal railways of the Crucible Steel Company at Clairton. They will be linked up with the Pittsburgh, Virginia & Charleston division of the Pennsylvania Railroad on one side of the Monongahela River and the Pittsburgh & Lake Erie Railroad on the other by means of a great steel bridge spanning the river. The contract for this bridge has been placed with the American Bridge Company.

### PERSONAL.

W. M. McFarland, acting vice-president of the Westinghouse Electric & Mfg. Company, will deliver a lecture on "Electric Power Distribution in Manufacturing" at Cornell University, on Friday, May 9. The several different systems of distribution and their relative advantages will be discussed, and the manner of applying electric motors to machinery will be illustrated by a large collection of stereopticon views.

W. C. Dickey left the New York office of the Cambria Steel Company on May 1 to assume new duties as secretary of the Maryland Sheet & Steel Company of Cumberland, Md. He will be the Eastern sales agent of the company, with headquarters at 1133 Broadway.

Herman Blevins of New Castle, Pa., has severed his connection with the American Tin Plate Company and will have charge of the electrical machinery at the New Castle Stamping Company's works, New Castle, Pa.

Andrew H. McNeal and I. Snowden Haines have resigned from the management of the Burlington, N. J., plant of the United States Cast Iron Pipe & Foundry Company.

O. T. Adams has resigned as superintendent of the Shelby Tube Works, at Ellwood City, Pa. For some time he was superintendent of both the Greenville and Ellwood City plants of the Shelby Steel Tube Company.

The degree of LL.D. was conferred on Lord Kelvin on Monday by Yale University.

J. Scott Anderson, formerly of New York City, has been appointed auditor of the Crucible Steel Company of America, at Pittsburgh, to succeed Julius Bieler, recently appointed treasurer.

William W. Hearne, a member of the firm of Matthew Addy & Co., pig iron merchants and importers, of Cincinnati, Ohio, has sailed for Europe.

James B. Brady, former general sales agent of the Pressed Steel Car Company of Pittsburgh, and R. L. Gordon, former chief engineer of the New York office of the same concern, have been placed in charge of the new sales office of the Standard Steel Car Company of Pittsburgh, at Maiden Lane and Broadway, New York.

Henry W. Oliver of Pittsburgh has been elected director of the Allegheny National Bank of Allegheny, Pa.

## OBITUARY.

CAPT. SAMUEL J. WHITESIDE, who died on April 19 at Columbus, Ga., was one of the more prominent business men of that State for many years. During the Civil War he was in command of the famous Iron Works Battalion, raised in Columbus from among the employees of the Columbus Iron Works, and rendered important services to the Confederacy, being placed in charge of the mechanical department of the Confederate States navy. Captain Whiteside was 71 years of age and was born in New York.

WILLIAM HARDIE LEITCH, general manager of the Jersey City Galvanizing Works of Jersey City, N. J., died suddenly of heart disease on May 2, at his home in Brooklyn, N. Y., aged 52 years. He was born in Allegheny, Pa., and had been connected with the Jersey City Galvanizing Company for many years. Mr. Leitch had been the treasurer of the New York Manufacturers' Association and was prominent in business circles.

JOHN G. FRITSCH, president and treasurer of the Francis Fritsch Foundry Company, died on April 27, at his home at Corryville, Ohio.

FRED. McCOMBS, assistant superintendent of the Lowellville furnaces of the Ohio Iron & Steel Company, was instantly killed a few days ago by falling 90 feet from a cage. The deceased was 30 years of age and a son of Superintendent W. S. McCombs of the company.

MORRIS LIPPMAN, formerly a member of the firm of Graff, Bennett & Co., of Pittsburgh, Pa., died on April 23 from apoplexy at St. Louis, Mo., aged 77 years.

**The Strike in the Lower Susquehanna Valley.**—HARRISBURG, PA., May 7, 1902.—(By Telegraph.)—With the exception of this city, puddlers in the Lower Susquehanna Valley are demanding a \$4.50 rate. At Lebanon over 2000 men are on strike at the mills of American Iron & Steel Mfg. Company, West End Rolling Mill and Lebanon Iron & Steel Company being idle. The Union Steel Mill of the Susquehanna Iron & Steel Company, at Columbia, is idle, but other mills are in operation. The tonnage men of the Penn Iron Company, at Lancaster, are also on strike. Efforts are being made to adjust differences at all places with some hope of success before the end of the week. The Reading Iron Company men have accepted an offer of general increase on June 1, and are at work. The Harrisburg rate is \$4.25, no demand for increase having been made.

President M. J. Drummond of the Glamorgan Pipe & Foundry Company of Lynchburg, Va., has notified the pipe foundry employees of an advance of 10 per cent. in their wages. This company are one of the largest producers of cast iron gas and water pipe in the country, having large pipe foundries at Lynchburg, Va., and Radford, Va. Seven hundred men are affected by this advance.

S. B. Lafferty, the manager of the Red Jacket Mfg. Company of Davenport, Iowa, left last week for an extended trip on the Pacific Coast. This firm have a demand for their line of steel, brass lined and artesian well cylinders for heavy work on the Pacific Coast.

The Improvement Committee of Caldwell, Ohio, have secured the location for the plant of the Cambridge Mining Car Company, Cambridge, Ohio. Work on the erection of a plant will start at once.

The project for holding an exposition of British manufactures in St. Petersburg this year has been abandoned.

Spon & Chamberlain, publishers of engineering books, have removed from 12 Cortlandt street, New York City, to the Liberty Building, 123 Liberty street.

## AMONG THE HARDWARE TRADE.

The S. J. Stebbins Company, 76 Van Buren street, who are among the oldest retail Hardware merchants in Chicago, suffered the loss of their stock by fire on the 13th ult. The cause of the fire was crossed electric wires in the basement. The loss is estimated at about \$10,000, covered by insurance. It is the intention of the company to resume business in the old location as soon as the building can be repaired and made ready for their occupancy.

Hahnenkratt & Ames, Washington, Kan., are successors to W. J. Holloway. The new firm have made a number of improvements in the store, which have materially increased its convenience and attractiveness.

F. D. Copsey has sold his Hardware and Stove business in York, Neb., to C. A. Schrandt.

Young Hardware Company, Napa, Cal., are successors to Young & Barker. The store has lately been remodeled and is now strictly modern in its appointments.

J. F. Lowrey, president of the Lewers & Cooke Company, Honolulu, Hawaiian Islands, is now in the United States making purchases for their new Hardware store, which will be completed July 1. Among other purchases he gave an order to the J. D. Warren Mfg. Company, Chicago, for a complete equipment of Warren shelving, covering their full line of not only patent glass front shelving fixtures, but also display floor cases, counters, &c. The shipment will amount to several carloads. This outfit will thus be shipped 5000 miles and the freight on it will amount to \$5 per 100 pounds. The J. D. Warren Mfg. Company receive full prices, notwithstanding this heavy freight rate. The compliment thus paid to the Warren shelving is a high tribute to its special fitness for the requirements of the Hardware business. The Warren Company have also just received a letter from E. O. Hall & Sons, Honolulu, stating that the Warren shelving which they bought a year ago is in constant use and is giving excellent satisfaction.

The Ashton Hardware Company have succeeded to the business formerly conducted by the estate of Thos. E. Ashton, Mayetta, Kan. They are occupying a new store building, 26 x 110 feet.

Samuel K. Painter has sold his Hardware, Stove and Tin business in Lindsay, Neb., to C. J. Steiner.

The recent floods damaged the interests of Hamblet & Hayes, Peabody, Mass., wholesale and retail general Hardware and Curriers' and Manufacturers' Supplies, to the extent of several hundred dollars. The storehouse of chemicals and cellar of store were flooded to the depth of 15 to 18 inches.

Stein Bros. have succeeded O. E. Champe in the Hardware, Tinware and Sporting Goods business in Hastings, Neb. The new proprietors have remodeled the entire building, and now have three floors, each 44 x 130 feet, and one floor 44 x 50 feet.

The Strong Hardware Company, wholesale and retail merchants, Burlington, Vt., have purchased the S. W. Woodbury stock of Hardware, at Northampton, Mass. The stock inventoried at \$20,000, and will be shipped to Burlington.

Jas. A. Riley & Son, wholesale and retail Hardware and Farm Implement dealers, Goshen, Ind., have lately purchased the tin and repair business of Otis L. Fuller, and the shop has been removed to the rear of the second floor of the Riley Building. Mr. Fuller will manage this new department of the business.



# HARDWARE.

SINCE the coming of the good times which the trade is now enjoying, and for the continuance of which they are hoping, the condition of things which has prevailed in Hardware has contributed materially to the strengthening of the position of the wholesale houses. This is owing not only to the large volume of business which has been transacted, but in more than one respect the existing prosperity has tended to make their business unusually satisfactory. As a result, nearly all the Hardware jobbers have reason to congratulate themselves on doing a successful business with at least a reasonable profit.

It is generally recognized that under conditions which prevailed during the years of depression it was a difficult thing for jobbing houses, unless very favorably situated, to make even reasonable profits in view of the capital expended and the labor and ability given to the direction of the business. With a declining market, a condition which confronted the trade for a long series of years, it required special energy and exceedingly good management for the jobbing trade to be able to show more than a meager profit. This was a result of the close competition and the heavy expense which attends the distribution of Hardware under existing methods. During the long period in which goods kept going down with only brief exceptions, when for a time the market recovered tone and prices temporarily advanced, it was not an easy thing to figure out anything like a satisfactory profit. Many a house admirably managed was obliged to write off a loss at the end of the year. With the coming of good times and an advancing market all this was changed. The value of goods carried over from one season to another was increased instead of diminished. The taking of stock which had appreciated in value was a comparatively pleasant task. This state of things, too, contributed directly to the jobber's success, as it permitted him to buy with a liberality that savored of speculation. With his opportunities to forecast the course of the market he was able time and time again to buy in anticipation of advances. On such goods he, of course, realized a handsome profit, provided they were marketed, which was not always the case, on the basis of the new prices rather than the lower ones at which the goods were bought. Business of this character contributed very largely and is still contributing largely to the jobbers' success. So important an aid is the upward movement of the market that it has been said that it is in a great many cases essential to the success of the wholesale Hardware trade. This is undoubtedly an overstatement, which is disproved by the steady growth of jobbing houses, large and small, during bad times as well as good, but there are many houses whose paltry profits during the periods of depression illustrate the truth that underlies the remark.

The good times have in another way tended to make the jobbing trade especially satisfactory and remunerative. When the wholesale houses have been in a position to buy so liberally that without much difficulty they take practically the entire product of the manufacturers at prices which were satisfactory to the manufacturers, it was natural that they should be made the principal channel of distribution. It was obviously easier for the producer of goods to let them go to the trade through the jobbers than to take the trouble of canvassing for other customers. Manufacturers, too, in these circumstances were ready to arrange their terms and

systems of prices in such a way as to serve the interests of the jobbers, which they are now doing more generally and to a greater extent than usual.

These influences have not only contributed to the success of the jobbing trade, but they have had the effect of largely increasing the number of houses who are entering the jobbing field—very often in a small way, but to an extent at the same time which makes them very desirable distributors of Hardware. Many houses are, indeed, adding a wholesale department on a moderate scale, as they find that this can be done advantageously in connection with a large and profitable retail business. It should, however, be remembered by all in the trade that it is not likely that the favorable conditions which have prevailed for several years will indefinitely continue, and it is obvious that with a different state of things changes may occur which will bear adversely on methods of distribution which have been found the most natural, perhaps the most economical, in an era of exceptional prosperity.

## Condition of Trade.

The difficulty in obtaining goods, especially season goods, is a marked feature of the trade at the present time. An unusual number of lines are in scant supply. This condition characterizes not only spring and summer goods, but many other lines such as Builders' Hardware and many kinds of heavy Hardware which feel immediately the effect of the difficulty in obtaining raw material. While in certain ways the trade is not so active as it was this is regarded as owing principally to the fact that stock orders were placed some time ago, and with the liberality which characterized the buying were of sufficient size to cover the season's requirements. The jobbers unanimously report a large volume of business. Prices are steady and have something of an upward tendency. The changes, however, the past week have been few. Of most general interest is a change in the Cut Nail card, which, though not involving an important advance, will entail some labor on merchants who have become accustomed to the old one. The amount of building throughout the country is large, and all the indications point to a very satisfactory trade in this line so far as volume is concerned. The close prices at which it is done and the lack of harmony between the manufacturers, jobbers and retailers in the marketing of this line tend to make the business annoying and unsatisfactory. Export trade is rather quiet for several reasons, a marked factor being the great home demand and resultant higher prices. Australian trade is curtailed by the tariff discussions in that country. While it is true a tariff was adopted and became effective October 8, 1901, there have been constant debates and modifications of it in the Australian Parliament, and it is believed it will be well into the fall of the present year before the agitation is settled, if it is then. The uncertainty is especially reflected in such important staples as Barbed, Fence and Galvanized Wires. In South Africa some heavy orders have been received in anticipation of the necessary repairs required to make good the condition of railroads, factories, buildings, residences, &c., more or less damaged or destroyed by the war, and material of various kinds is still going forward for the military authorities.

### Chicago.

(By Telegraph.)

The situation in Hardware lines is but slightly changed, and there has been but little falling off in the aggregate volume of business. However, some dealers

have experienced a less urgent demand for all seasonable goods, attributing the apparent decrease in interest to the fact that farmers are now actively engaged in spring work and hence are making fewer demands on retailers, which in turn is reflected on the jobbing trade. Agricultural implement manufacturers, too, with the exception of a few urgent buyers, have been out of the market. The only change in prices that has been noted has been in some sizes of Cut Nails, which have been advanced by a change in the card. The demand for Wire Cloth has continued as urgent as ever and buyers find much difficulty in obtaining the quantities needed. One order for two carloads in the market the past week could not be filled, although 10 to 15 cents premium on current prices from store was offered. The situation in Ice Cream Freezers, Carpenters' Tools and Builders' Hardware has remained unchanged. There is again some interest displayed in the outcome of the jobbers' combination movement, and it will not be surprising if one local house should join the new corporation, but while the matter is evidently being considered seriously, no decisive action has been taken. The generous rains which have fallen in Iowa, Kansas, Nebraska, Missouri and Illinois have assured the continuation of present confidence in an active Hardware trade next year. In Heavy Hardware there has been little change to note. The volume of business has continued heavy, but the usual complaints in regard to the delay of shipments from mills continue to be one of the aggravating symptoms.

### NOTES ON PRICES.

**Cut Nails.**—The Cut Nail Association, which held its meeting April 30, made no change in the base price but reaffirmed that existing, for the month of May. A new list of extras was, however, adopted at the meeting, by which advances were made on some of the smaller sizes, including 3d Fine; also on the entire line of Clinch, Car, Boat, Chute, Clout, Hoop and Hinge Nails. The revised card is as follows:

Common, Fence, Hookhead Brads and Sheathing.		Common Barrel, Roofing, Cooper and Cement.	
	Extra.		Extra.
20d to 60d, base.....		1½-inch.....	\$0.30
10d to 16d.....	\$0.05	1½ ".....	.40
8d and 9d.....	.10	1½ ".....	.50
6d and 7d.....	.20	1½ ".....	.60
4d and 5d.....	.30	1 ".....	.70
3½d.....	.40	¾ ".....	.85
3d.....	.45	¾ ".....	1.00
2d.....	.75		
Casing, Box, Flooring and Fin- ishing (New York Pattern).		Slatting.	
10d and larger.....	.15	6d.....	.30
8d and 9d.....	.25	4d and 5d.....	.40
6d and 7d.....	.35	3d.....	.60
4d and 5d.....	.50	2d.....	.80
3d.....	.70		
2d.....	1.00	Clinch, Car, Boat, Chute, Clout, Hoop and Hinge.	
Fine Finishing.		3-inch and larger.....	.45
10d and larger.....	.25	2½ and 2¾ inch.....	.55
8d and 9d.....	.35	2 " and 2¼ ".....	.65
6d and 7d.....	.45	1½ and 1¾ ".....	.75
4d and 5d.....	.65	1¼ ".....	.95
3d.....	.85	1½ ".....	1.05
2d.....	1.15	1 ".....	1.15
Fine Nails.		¾ ".....	1.30
4d.....	.50	¾ ".....	1.45
3d.....	.75		
2d.....	1.00	Tobacco Manufacturers' Box Nails.	
3d Fine (Eureka).....	1.25	6d and 7d Lining.....	.20
3d Fine (Light).....	1.25	4d and 5d.....	.30
Cut Spikes.		5d Caddy.....	.30
All sizes.....	.10	4d ".....	.50
Light Barrel and Lining.		3d ".....	.70
1½-inch.....	.75	Tobacco Warehouse.	
1 ".....	.85	8d.....	.10
¾ ".....	1.00	6d and 7d.....	.20
¾ ".....	1.20	4d and 5d.....	.40
Each Half Keg, 10 Cents Extra.			

Terms are 60 days, or a discount of 2 per cent. for cash if remitted within 10 days from date of invoice. Sales are subject to strikes and accidents at the works, and prices are subject to change without notice. It is questioned by some in the trade whether the 10 cents advance per keg on 3d Fine Nails can be maintained, as some concerns who make a specialty of this size have been selling in carload lots at less than the established extra before the advance. It has been remarked that manufacturers cannot change the advance on contract orders awaiting shipment at mills, and that the competition among jobbers will hardly permit the advance being

held to by them until such stocks have been exhausted. The market is firm at the following quotations, f.o.b. Pittsburgh, plus the actual freight to point of destination, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....	\$2.05
Less than carload lots.....	2.10

**New York.**—The demand for Cut Nails in the local market is fair. All jobbers are not asking the advance in extras on the new card. Quotations for carloads and less than carloads are as follows:

Carload lots on dock.....	\$2.18
Less than carload lots on dock.....	2.23
Small lots from store.....	2.30

**Chicago, by Telegraph.**—The principal feature of the week has been the issue of a new schedule of prices of Cut Nails, an advance being made on special Nails. The demand has continued fair and small lots have continued to be sold at \$2.30.

**Pittsburgh.**—No change was made in base price of Cut Nails at the meeting of the Cut Nail Manufacturers' Association, held on April 30, but a new card of extras was adopted. Complaints are still made of the scarcity of Steel, and prompt shipments of Cut Nails are sometimes retarded on this account. We quote Cut Nails at \$2.05, base, in carloads, and \$2.10 in less than carloads, f.o.b. Pittsburgh, plus freight in Tube Rate Book to point of destination.

**Wire Nails.**—Current demand for Wire Nails is large, while specifications on contracts placed some time since are being shipped by the mills. The tone of the market is firm and quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.05
To jobbers in less than carload lots.....	2.10
To retailers in carload lots.....	2.10
To retailers in less than carload lots.....	2.20

**New York.**—The volume of Wire Nails distributed by local jobbers during the month of April was gratifying. The present demand is satisfactory and owing to receipts of recent shipments from mill, stocks are better assorted. The market is represented by the following quotations: Small lots from store, \$2.30; carloads on dock, \$2.18 to \$2.20.

**Chicago, by Telegraph.**—There has been a fair jobbing demand for Wire Nails and but little change in the situation at the mills. A strong tone has continued to prevail, but prices have been without essential change. Small lots are selling from store at \$2.25 to \$2.30 and single carloads at \$2.20. Much interest is centered in the next meeting of the independent Wire mills, which will probably take place early this month.

**Pittsburgh.**—We note a continued active demand for Wire Nails, but the mills are making shipments more promptly than for some time. There is some talk of a consolidation of some of the independent Wire Nail mills, and it is possible a meeting will be held later in this month to take action on this matter. Official prices of Wire Nails are pretty well observed, but occasionally slight concessions are offered. We quote Wire Nails at \$2.05 in carloads and \$2.10 to \$2.15 in small lots.

**Barb Wire.**—Manufacturers of Barb Wire have not been able to catch up with the orders on their books. Current demand continues heavy. Prices are firmly maintained and are represented by the following quotations, f.o.b. Pittsburgh, 60 days, or 2 per cent. for cash in 10 days:

	Painted.	Galv.
To jobbers in carload lots.....	\$2.60	\$2.90
To jobbers in less than carloads.....	2.65	2.95
To retailers in carload lots.....	2.70	3.00
To retailers in less than carloads.....	2.80	3.10

**Chicago, by Telegraph.**—Orders for Barb Wire have continued plentiful, and the market has remained firm at full prices, which remain at \$2.80 for Painted and \$3.10 for Galvanized in single carload lots, with 5 cents extra for small quantities.

**Pittsburgh.**—Demand for Barb Wire is active, and manufacturers are still considerably behind on contracts. The continued scarcity of Steel prevents maximum output of Barb Wire being obtained. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. dis-



count for cash in 10 days: Painted, \$2.60; Galvanized, \$2.90; less than carload lots, Painted, \$2.65; Galvanized, \$2.95.

**Plain Wire.**—Orders for Plain Wire continue liberal, and difficulty is experienced in getting prompt deliveries from mills. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. for cash in 10 days:

Base sizes.	Plain.	Galv.
To jobbers in carload lots.....	\$2.00	\$2.40
To jobbers in less than carload lots.....	2.05	2.45
To retailers in carload lots.....	2.05	2.45
To retailers in less than carload lots.....	2.15	2.60

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9.....	Base.....	\$0.40 extra.
10.....	\$0.05 advance over base.....	.40 "
11.....	.10 " " " " " " " " " " " "	.40 "
12 and 12½..	.15 " " " " " " " " " " " "	.40 "
13.....	.25 " " " " " " " " " " " "	.40 "
14.....	.35 " " " " " " " " " " " "	.40 "
15.....	.45 " " " " " " " " " " " "	.75 "
16.....	.55 " " " " " " " " " " " "	.75 "
17.....	.70 " " " " " " " " " " " "	1.00 "
18.....	.85 " " " " " " " " " " " "	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

**Chicago, by Telegraph.**—The consumption of Plain Wire continues at an active rate, with urgent orders received almost daily. The market has remained firm, jobbing lots selling from stock at \$2.20.

**Pittsburgh.**—Current demand for Plain Wire is large and the mills are crowded with orders. We quote Plain Wire at \$2 and Galvanized at \$2.40, in carload lots, f.o.b. Pittsburgh. For small lots the usual advances are charged.

**Tarred Roofing Papers.**—It is reported that the Barrett Mfg. Company, Chicago, Ill., in connection with the recent consolidation of manufacturing concerns making Coal Tar products, have bought the N. West Department of the Cambria Steel Company, which was the largest remaining competitor. The N. West Department, using the waste product of the Cambria Company in the latter's manufacture of coke, had become a factor in the business, the enterprise having been started a few years ago on account of the low price for Coal Tar paid by the Barrett Mfg. Company.

**Screen Doors.**—The manufacturers of Screen Doors report a large demand for the current season. This fact, together with the increased cost of lumber, gives the market a strong tone, and some of the manufacturers at least have recently been announcing higher prices.

**Binder Twine.**—Trade in Binder Twine continues light, owing to the disinclination of manufacturers to push sales in the present condition of the fiber market, while the uncertainty of the wheat crop offers no inducement for purchasers to buy at present beyond what they have already ordered. General quotations are as follows, f.o.b. New York, with ¼ cent per pound rebate in carload lots:

	Per pound.
Sisal .....	.11 to 11¼
Standard .....	.11 to 11¼
Manila .....	.13½ to 13¾
Pure Manila.....	.15 to 15¼

**Cordage.**—The trade continues to order Rope in a conservative way, buying only for immediate requirements. Sisal Hemp has advanced to such a price that manufacturers, as a rule, do not care to purchase. Sisal Rope in this market is quoted, on a basis of 7-16-inch and larger, at 10 to 10¼ cents per pound. This represents an advance of ¼ cent over former quotations. Manufacturers who have material on hand bought at lower prices than those ruling would probably shade present quotations for desirable orders. Manila Rope on the foregoing basis is quoted at 13½ cents per pound.

**Glass.**—The advance made by the National Window Glass Jobbers' Association, of which announcement was made in our columns last week, resulted in raising the price of the first three brackets of single strength to the same price as other sizes had been quoted. The advance places all single and double strength Glass from store

under the uniform discount of 89 per cent. Demand is not very active, but is showing some improvement. Quotations are as follows:

	Discount.
From store, single and double strength.....	89%
F.o.b. factory, carload lots:	
Single and double strength.....	90 and 5%

Representatives of the American Window Glass Company and of the Federation Window Glass Company have held meetings to determine the time for closing down the factories for the summer. The American Company may not operate beyond the 17th of this month, but it is an open question whether the Federation factories will consent to close down at that time. The Independent Glass Company state that they expect to keep in operation throughout May. A report comes from Pittsburgh to the effect that the American Company have agreed to a scale of wages that provides for an advance of 10 per cent. One of the stipulations under which the high rate of wages will be paid, it is stated, is that all workers stop this fire at the same time and start the next fire at the same time.

**Paints and Colors.**—**Leads.**—The consumptive demand for White Lead in Oil is reported to be larger than for the corresponding season of last year. Quotations are as follows: In lots of 500 pounds or over, 6 cents; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—**Linseed Oil.**—Manufacturers of Linseed Oil are employed in filling contract orders and are not seeking new business to any extent. Demand is confined to small lots on new orders. Quotations continue without change, as follows: City Raw, in lots of five barrels or more, 66 cents; in lots of less than five barrels, 67 cents per gallon. Out of town brands of Raw are quoted at 64 to 65 cents per gallon, according to quantity.

**Spirits Turpentine.**—The local market is sluggish, in sympathy with lower values in the South. Demand for Turpentine is light at the following quotations, according to quantity: Southern, 45½ to 46 cents; machine made barrels, 46 to 46½ cents per gallon.

## A PROPOSED EXPANSION BOLT COMBINATION.

CONSIDERABLE interest is manifested in a proposed consolidation of the principal manufacturers of Expansion Bolts. The matter was under consideration about a year ago and was again agitated some six months since, but nothing definite was accomplished either time. Recently several manufacturers have been approached by New York parties with a view of perfecting a consolidation of the leading manufactures. The New Jersey Foundry & Machine Company, manufacturers of the Diamond Expansion Bolt, New York, and the Steward & Romaine Mfg. Company, Philadelphia, Pa., are among those known to have been approached, and the representative of the latter company, who are very large manufacturers of this line, confirmed the report that an attempt at consolidation was under way. As illustrating the rapid growth in the use of Expansion Bolts, he said that their own business had increased over 1000 per cent. during the past five years, and that the use of various types of these Bolts would no doubt be much greater in the near future. No definite information, however, as to the plans of organization, &c., are obtainable at this time.

## REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

The store of Whipple & Robinson, Glens Falls, N. Y., has been gutted by fire and the firm will be pleased to receive catalogues and price-lists. Their line comprises Hardware, Stoves, plumbing, roofing, &c.

The American Coal & Shipping Agency, 2 Square de l'Opera, Paris, France, advise us that they would be glad to receive catalogues and quotations from manufacturers of Laundry Machinery.

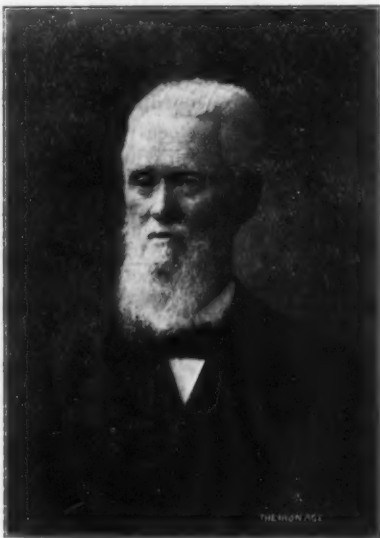
## New York State Association of Retail Hardware Dealers.

**I**N our last issue we chronicled the organization of a retail Hardware association in New York State at a meeting in Syracuse, which was largely attended when the fact is taken into consideration that it was simply an organization meeting and not in any sense a convention of the trade. It was the first coming together of merchants in response to a call issued by a single individual. As such the presence of so many and so representative a class of merchants is significant of the force of the considerations which brought them together and the large promise for the association's future growth and usefulness.

In this issue we present portraits of the officers who have been selected to direct the affairs of the association during the year. We also give letters from a number of them, in which their impressions of the Syracuse meeting and the work before the association are given. They will doubtless be of interest to our readers at large, but especially to those in New York State who have not yet been enrolled in the membership and who are thinking of affiliating with the association.

The newly organized association has chosen as delegates to the next meeting of the National Association F. W. Gardner of Saratoga Springs and John G. Ferris

of Albany. All information desired may be obtained from our secretary, John R. Taylor of Little Falls, N. Y., who will willingly supply all printed matter and fully explain the workings and object of the association. At the adjournment all felt the better for meeting such representative men from our noble State, and felt that they



H. D. HULL, President.

of Johnstown, the alternates being Charles G. Sherwood of White Plains and Allen S. Matthews of Fort Covington.

### From H. D. Hull, President

It was my privilege to attend the meeting of the retail Hardwaremen of the State of New York, held in Syracuse on April 28 and 29 last. I was very agreeably surprised at the number present, representing all portions of the State. All seemed pleased to meet and greet each other, and a feeling of brotherhood seemed to pervade the assembly and a desire to greet all connected with the trade and become better acquainted.

Conditions of trade which confront us at this time were freely discussed, and a general desire expressed that something might be done to better our condition. This being the first meeting of the kind in this State, and all unacquainted with the workings of such an association, it was slow work for a time, but with the assistance of Mr. Corey of Indiana, who is secretary of the National Retail Hardware Dealers' Association, all moved along nicely.

The enthusiasm and desire for improvement and willingness to assist in any movement of the kind was freely expressed, and all felt that something can and will be done to better our condition if all the Hardware dealers in the State will join this association and give it gen-

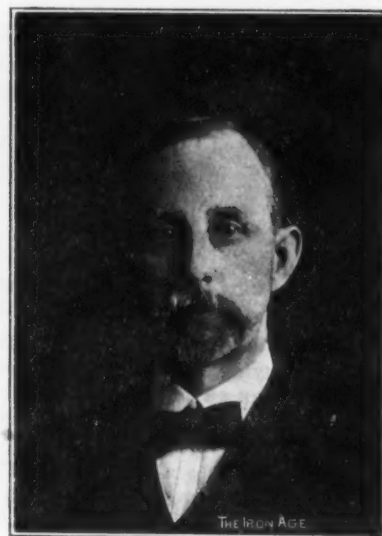


W. D. HOLLOWELL, First Vice-President.

could go back to work with more vigor and a determination to use their best efforts for the interests of the association, hoping that when we meet again in February next, we may find something has been done to our advantage, and that we may show a large increase in numbers, and as numbers increase our influence may also increase, until we feel that the retail Hardware trade cannot be ignored.

### From W. D. Hollowell, First Vice-President.

While I am not of those who seem to think the organization of a Hardware Dealers' Association will prove



THOMAS MALONEY, Second Vice-President.

a panacea for all the annoyances which prevail in these modern times, and while I do not think the association can ever annihilate department stores and catalogue houses, yet I am well satisfied that it is certain to be of great benefit to all who join the association and attend



its meetings. If there was nothing more to be gained, I am sure that the more intimate acquaintance and the exchange of ideas among dealers in the same line of business is always of great advantage, and I doubt if there is a single member who could attend a two days' meeting of the association without getting information and learning of plans and methods of other dealers that would be useful to him in his business.

But the greatest success of the association depends very largely on its membership—in its strength. With a membership of, say, 500 in this State, I can see wherein this association might become a power for doing good in correcting and checking bad legislation, demanding fair treatment from manufacturers and jobbers, disseminating ideas, plans and methods, and in many other ways proving of incalculable benefit to every legitimate Hardware dealer in the State.

The association has been organized under very favorable conditions, and although the membership may not seem large for the great State of New York, yet I confidently believe that within the next year it will be

been formed, and they have assured me that we will have their good will, as they approve of the movement.

The Executive Board will meet soon and make the necessary arrangements for the proper installation of the office of the secretary and take up such other matters as may call for official action. It is yet too early to publicly discuss plans and purposes, but I am confident that the officers of the association are a body of



JOHN R. TAYLOR, Secretary.

very materially increased, and every member should take an interest in bringing about that result.

#### From Thomas Maloney, Second Vice-President.

The meeting of the Hardware dealers at Syracuse on the 28th and 29th ult. for the purpose of forming an association, being so largely attended by representative dealers throughout the State, emphasizes the need of an association which is felt by dealers in general Hardware, and I think it will be found to fill an important place with the merchants in the Hardware business largely throughout the State who have grievances resulting from methods of selling goods used by some manufacturers and jobbers, and particularly it will infuse a better and more friendly feeling among the merchants themselves in the way of regulating reasonable and fair profits.

As the organization progresses and grows larger and more influential, the rights and interests of its members will command more respect, if the experience of other associations and combinations means anything.

#### From John R. Taylor, Secretary.

I, for one of those who attended the organization meeting of the New York State Association of Retail Hardware Dealers, am very much pleased with the outcome, and, I must say, the attendance and enthusiasm were beyond what I had expected. Since my return I have met many jobbers and manufacturers who have expressed much satisfaction that the association has



J. H. CALLAHAN, Director.

men who may be depended upon to give us such benefits as are due and possible from a well equipped organization.

#### From A. F. Miller, Director.

I was deeply impressed with the broad gauge character of the Hardware men who attended the Syracuse convention, and with the earnestness and enthusiasm with which they took up the work of organization.

The association certainly starts out under very favorable auspices, and the good that it can accomplish in the way of correcting existing evils in the trade, the adoption of better business methods, and the cultivation of a fraternal spirit among its members should appeal

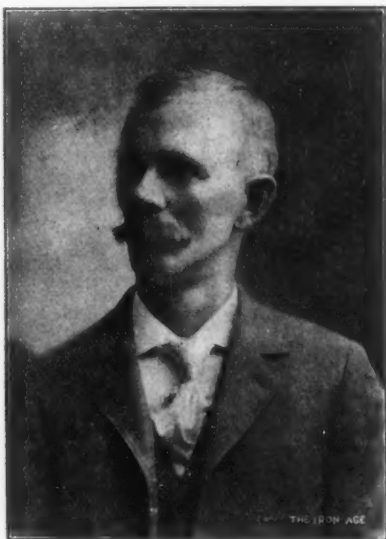


A. F. MILLER, Director.

to every Hardware dealer in the State of New York. I would strongly urge those who have not already signified their intention of becoming members to send their names to the secretary at once, and let us make the New York Retail Hardware Dealers' Association the largest and strongest association in the country.

**From Geo. B. Allen, Director.**

I wish to congratulate the retail Hardware dealers of New York State on forming an association, through the efforts of Mr. Taylor. The benefits of an association can only be realized by being an active member and every retail Hardware man should join and attend



GEO. B. ALLEN, Director.

the meetings. In our local association we have had an opportunity to demonstrate the fact that great benefits can be derived by united efforts. Success is assured if the officers are untiring and have the co-operation and support of the members.

**From H. M. Countryman, Director.**

This organization of retail Hardware dealers is the beginning of a long needed movement in our line of business. The attendance at this, the first meeting, seemed very remarkable to me, being far ahead of my



H. M. COUNTRYMAN, Director.

expectation. I anticipate the membership will reach 500 before the close of the present year.

Any organization starting with the enthusiasm manifested at that meeting cannot but succeed.

**From Geo. W. Rockwell, Director.**

I feel that the association has started out with the most flattering prospects and consider it one of the very best moves that the trade has made since I have

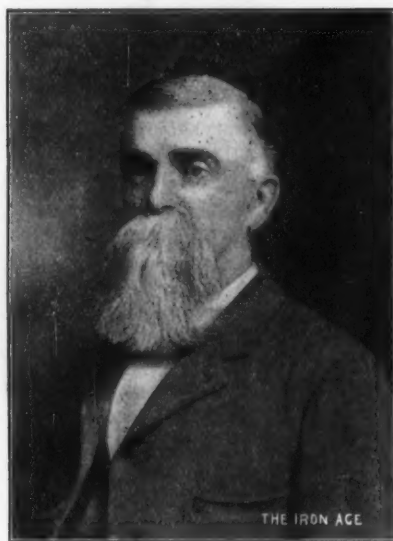
been in business, and that is since 1879. The firm that do not join and help the good work along, not only stand in their own light, but in the light of others. I have only the good of the cause at heart and shall certainly do all in my power to help it along.

**From John J. Sage, of Rochester.**

I think that if the work is pushed so as to get into the association all retail Hardware dealers in this State, we will be able to make jobbers and manufacturers careful as to selling their goods to catalogue houses and others. It will do us all good to meet and learn each other's views and ways of doing business, also to learn to help each other as brothers, instead of trying to see how low we can sell and get the business away from the other fellow.

**PRICE-LISTS, CIRCULARS, &c.**

CHISHOLM & MOORE MFG. COMPANY, Cleveland, Ohio: An illustrated catalogue is devoted to Differential Chain Hoists and Pulley Blocks, Trolleys and Hoists, Door



O. D. TOWNE, Director N. Y. Association.

Hangers, Rail Braces and Joints, Pneumatic Motors, &c. The company also make light and medium weight Malleable Iron Castings to order.

THE CLEVELAND STORE FIXTURE COMPANY, Cleveland, Ohio: Showcases and Soda Fountains. An illustrated catalogue is devoted to each of these lines. The catalogue relating to Showcases shows these without metal or wood moldings, also with moldings. Illustrations are given of interiors fitted with Showcases with low bases, among which is one of a Hardware store.

OWOSSO MFG. COMPANY, Owosso, Mich.: Illustrated catalogue of Screen Doors, Window Screens, Window Screen Frames and Scythe Snaths.

AMERICAN CREAMERY COMPANY, Waterloo, Iowa: Price-list of supplies for creameries, cheese factories and milk dealers manufactured by them.

THE RED JACKET MFG. COMPANY, Davenport, Iowa: Red Jacket Pumps. The company issue an illustrated booklet in verse, which explains the ease with which their Double Acting Pumps may be fixed.

AMES PLOW COMPANY, Boston, Mass.: Seeding and Cultivating Implements. An illustrated catalogue and price-list is devoted to a line of Matthews' New Universal Seeding and Cultivating Implements. The company also issue an illustrated price-list of their Ice Tools.

GOSHEN BUGGY TOP COMPANY, Goshen, Ind.: 1902 catalogue of Buggy Tops, Cushions, Carriage Hardware, Tanks, Ladders, Wagon Makers' Supplies, &c.

STUDEBAKER BROS. MFG. COMPANY, South Bend, Ind.: "Half a Century's Growth" is the title of a pamphlet issued as a souvenir on the occasion of the golden jubilee anniversary of the founding of the establishment by John



Studebaker in 1852. A portrait is presented of Mr. Studebaker, and also a view of the first shop. The present immense plant, with an annual output of over 100,000 complete Vehicles, is also the subject of an illustration.

THE MORGAN COMPANY, Chicago, Ill.: Revised catalogue for 1902 of Ladders and Lawn Furniture, with illustrations of the principal articles offered to the trade.



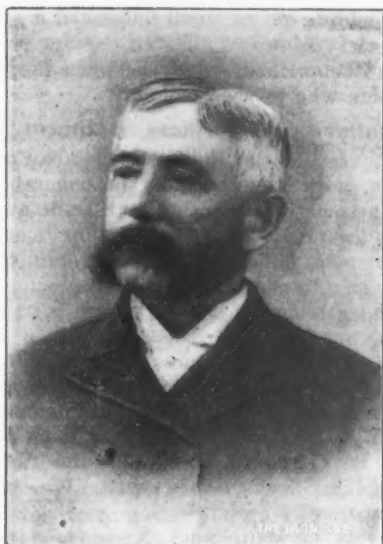
GEO. W. ROCKWELL, Director N. Y. Association.

A feature which will doubtless be appreciated is the giving of the correct weight of the principal articles, which is of advantage to shippers in estimating freight.

HAWORTH & SONS MFG. COMPANY, Decatur, Ill.: Catalogue of Haworth Planting Machinery, Showing Disk Drills, Shoe Drills, Press Attachment, Hoe Drills, &c.

### STUART-HOWLAND COMPANY.

STUART-HOWLAND COMPANY, 281-287 Devonshire street, Boston, Mass., have issued a 332-page illustrated catalogue and price-list of Electrical Supplies and



ALLEN S. MATTHEWS, Director N. Y. Association.

Specialties. The aim has been to supply a book of reference in which the Hardware trade, purchasing departments of electrical construction, supply and telephone companies, central stations and railways may quickly find listed, and in most cases illustrated, practically everything required in their business. A feature of the catalogue is the arrangement of the goods, which follow each other in alphabetical order.

## The Jobbing Consolidation.

VERY little has been given to the public since our last issue in regard to the work of consolidation. It is understood that accountants are busy giving attention to a multitude of details involved in questions concerning the transfer of titles of the establishments to be taken into the National Hardware & Metal Company. So much work of this character is to be done that those closest to the management of the enterprise intimate that it will be several weeks before things are in final shape and the new corporation are actually organized. Meanwhile the trade are wondering at the cause of the delay and querying as to whether any obstacle to the success of the project has been encountered. Those identified with the movement, however, scout the suggestion that there is any uncertainty in regard to the consummation of the consolidation. Some in the trade, however, have misgivings in regard to the success of the effort on the lines outlined by its promoters.

In the following columns we give matter relating to the subject which presents it in very different lights. A strong letter to their customers from a leading house who announce their connection with the consolidation presents an authoritative statement in regard to it, and the methods, in part at least, which will be pursued. Another forcible communication from a man of long experience and with broad interests argues against the success of the consolidation, which he interprets as an effort to keep alive a diminishing business. Other letters from retail merchants and manufacturers deserve consideration as reflecting the views of those whose attitude toward the consolidation will have much to do with its success.

In the letter given below we have the first public announcement by any house advising the trade of their identification with the consolidation of jobbing interests. In this address to their customers by the Gray & Dudley Hardware Company, a house who have occupied a prominent position on account of the volume of their business and their admirable business methods, they give the trade their views in regard to the matter, presenting clearly and forcibly the arguments which, in their judgment, justify the consolidation as an advancement in the distribution of goods. This communication has more than passing interest, as it may be regarded in the light of an official announcement of the way in which the consolidation is regarded by those identified with it and the methods which it is intended to pursue:

NASHVILLE, TENN., April 18, 1902.

DEAR SIR.—You were perhaps surprised to read an account in the newspapers of our having become a link in the chain of Hardware distributing houses, known as the National Hardware & Metal Company. This amalgamation will probably not occur for 30 or 60 days, and when it does our business will continue just the same as heretofore. Your orders will be just as much appreciated and as well handled as ever. We wish to say that in taking this step we fully considered the interests of our customers and the consumers, as well as our own interests.

The science of distribution of goods is one that is receiving a great deal of attention by the commercial world. As the jobber's profits have gradually grown less for a number of years his attention has naturally been drawn to the question of a reduction in expense of handling the product of manufacturers. Experience has proven that the larger jobbers have been able to handle goods at a much less percentage of expense than the smaller jobbers. Inasmuch as the jobber's profit has already been reduced to a minimum, and as the retailers and consumers are paying as much for the goods as present conditions warrant, the demand for a reduction in the expense of handling the goods by the jobber is imperative. With the above conditions staring us in the face, we feel that it was a duty we owed our customers and the consumers of our territory to put ourselves in a position to handle the product of manufacturers at a smaller expense.

The advantages to the retailer and consumer of this chain of houses are very many. It will enable the re-

taller to draw his stock of goods from his nearest jobbing town, where a stock will be kept as complete as is kept in any part of the United States, and the goods can be shipped from the house promptly, and will not have to be ordered from the factory, as is frequently the case in various parts of the country. The retailer will receive his goods quicker, which is an important item, as it enables him to do business with a smaller stock of goods than he would have to carry if he drew his goods from distant jobbing centers. Every retailer will also get the benefit of the close buying of the National Hardware & Metal Company, who will be by far the largest buyers of Hardware in the world.

It is therefore not a matter of surprise that ourselves and other leading houses of the United States are availing themselves of the opportunity to form a link in this chain, which is gathering strength as it increases in length.

It will be the policy of this new company to market their goods through the legitimate retail trade, and as they retain the employees of the old companies, you will readily see that the business will be handled in future on the same lines as in the past, and any orders intrusted to us will receive the usual prompt and careful attention. The policy of the company toward the manufacturers, retailers and consumers is to be broad and liberal, as they realize that on this basis alone can a large and successful business be conducted, and they also realize that their facilities for distributing Hardware will not be equalled by any other institution in the world, and the people from whom they buy and to whom they sell will appreciate this fact more each day.

When we again have the pleasure of a visit from you you will find the same old crowd at the old stand ready to give you a cordial welcome. We take this opportunity to thank you for many favors and solicit a continuance of same. As we have not been in the habit of writing you long letters, we hope you will pardon this violation of the rule.

Yours truly,

GRAY & DUDLEY HARDWARE COMPANY.

### THE JOBBERS' COMBINATION.

BY A WESTERN MERCHANT.

#### A Fight for Existence.

The evolution that has been taking place in the Hardware trade has reached the point where the jobber, or wholesaler, has to fight for his existence. Before him is the retailer, who has grown in intellect and experience, and is determined to buy direct from the manufacturer. Behind him is the manufacturer, who is only too glad to meet the retailer half way.

The jobbers' union was formed to block the wheels of progress and prevent the manufacturer from meeting the retailer unless he paid toll in crossing the jobbers' bridge; but it has not accomplished its purpose. It has not even retarded the progress of events a single day.

Having failed in that effort, the new move has been brought into existence—an immense and seemingly all-powerful combination of the wholesale dealers of the country into a gigantic company. That the infant is still weak, however, is shown by its diet; two-thirds water.

#### Consolidation a Confession of Weakness.

Is it not a confession of weakness upon the part of every house that has consented to sell itself and lose itself in this huge venture? Look at some of the well-known names which are as familiar to the Hardware world as household words! What is their reason for consenting to go into oblivion? If they are getting a higher price for their stores than they consider them worth, who is paying that price? The company of which they are a part. Do they expect to unload this stock upon innocent suckers? The Bicycle stock, the Tin Can stock, the Silverware stock, and others do not seem to give rich promise of a public anxious to partake of a diet that is so largely water.

#### Wholesale Business on the Wane?

If these houses are selling their assets at a fair price it must be because they are anxious to get out of business and convert their capital into something besides

Hardware. And if this is true it emphasizes what some of us know personally and what all the signs of the times seem to indicate—that the wholesale Hardware business is a good one to get out of.

#### Cost of Doing a Jobbing Business.

Turn back, if you can with convenience, to some of the papers read at the Hardware jobbers' reunions. Read carefully the claims made as to the cost of doing business. You will see that this is given as about 12 per cent. of the cost of the goods handled. If you study that a moment you will find the principal reason why the Hardware jobber is destined to go. How will the consolidation better this?

#### Reducing (?) Expenses.

We are gravely informed that the saving on catalogues alone will be \$100,000. This, on a capital of \$120,000,000 (two-thirds of which is unfiltered water), would pay a dividend of one-twelfth of 1 per cent. This alone ought to make it a lively stock on Wall street!

If the houses that are purchased are continued as they now are, where will the reduction in expense be? Does any sane man believe that the combine will continue five or six branch houses in Boston, having five or six sets of salesmen traveling the same territory, soliciting orders from the same men?

Four or five houses in Cleveland are reported as sold out to the combine. Will four or five sets of housemen and roadmen be continued as before?

#### Part Played by the Dismissed Traveling Salesmen.

To answer that in the affirmative would be to suppose that the men at the head of the combine were fools. And we all know very surely that they are not.

If four-fifths of the Cleveland traveling salesmen are dropped by the Trust, will they quietly accept the situation and seek other avocations? Or will they use their utmost endeavors to go over the same territory where they are well known for other houses?

#### Competition Will Increase Rather Than Diminish.

Is it likely, even with four houses turned into one, that competition will be any less in the Cleveland field? It is not reasonable to suppose that a single inch of that territory, or any other, will be given up by the houses outside of the Trust, or that competition will decrease one iota.

On the contrary, what may safely be looked for, if the gigantic combination is formed?

*First*, a budding out as small jobbers of a great many large retailers.

*Second*, a duel without mercy between the Trust and all the jobbers who refused to join it.

#### Influence of Business Sentiment.

Take a house like the Biddle Hardware Company of Philadelphia, with a long history of honorable dealing and kindly association with the retail trade over a large part of the country. Will the traveling men for this house find it more difficult, or less, to retain their trade when they come in competition with the octopus?

We are accustomed to say that there is no sentiment in business, but it is not true. There is a wonderful amount of sentiment in business every day of the year. The secretary of a large trust told the writer a few days ago: "The trade in our line meets our competitors with open arms; not because they care for them personally, but because we are called a trust, and the trade is down on anything that looks like a trust. We have uphill work all the time."

What is this but sentiment? And it is a feeling that is utterly dead to logic or reason. It is there, it must be considered, and it is doing the work for those who are competitors of any combine or trust.

#### Individuals vs. Octopus.

All shrewd men must see that if ever there was a time to go into the wholesale Hardware business, conditions being as they are, now is the time. The competition of 40 or 50 houses will be minimized, if not neutralized, by the sole fact that they are no longer individual, aggressive entities, but have become mere branches of a hideous octopus.



### The Manufacturer

who proposes to retain his identity and his place in the world will have nothing to fear. He will feel closer and draw nearer to the retail trade, and all the sooner come to the end where Fortune has been carrying him for some years.

#### Consolidation Will Help All Interests But Its Own.

My conclusions are that the consolidation

1. Will help the retail trade of the country, because it will push it closer to the manufacturer.

2. It will help the independent wholesaler because of the strong, unreasoning, uncontrollable sentiment against trusts and combinations.

3. It will help the manufacturer, because it will push him the faster into closer connection with the real distributing branch of the Hardware business—the retail trade.

And this is the result to which all evolution has been pointing for the past 25 years.

### LETTERS FROM THE TRADE.

We give below extracts from letters received from Hardware merchants in which the consolidation is touched upon. They are of interest as reflecting the views of the trade:

#### *Retailers Must Organize in All States, Says a New Jersey Merchant.*

There is but one point in the whole matter, self-interest. It is not protection or defense, as there is no cause, or disturbance to warrant either at the present time; but I can see in the future where there may be reasons for the combination of jobbers. It is a far fetched question, and requires deep thought and reason.

First let it be understood that the jobber is an adjunct, and has crowded in between the retailer and the manufacturer. In a general way he is a real adjunct to both. A combination of jobbers is a serious question. First, it may dictate to the manufacturer; second, to the dealer; on the other hand, it may assist both manufacturer and dealer if motives are pure and mutual; if otherwise, disaster awaits it.

With combinations of manufacturers and now the combination of jobbers, the retailers must get together and form associations in every State, the National Association representing the whole. Then each combine will look out for its own interests and each act as a check on the other. Harmony must prevail or a colossal disaster ensue. Until the retailers fall in line and complete the last link of the chain there will be trouble and discord.

#### *From a Large Illinois House.*

We have read the opinions in *The Iron Age*, and have enjoyed same very much, and find some of them which strike the nail on the head pretty squarely. As small jobbers we would be more likely to suffer from this combination than the larger jobbers or the smaller retailers, but after knowing the stand that some of the larger manufacturers in the United States have taken on this subject we feel as if this combination would have no effect on us whatever.

#### *Will Benefit the Retail Hardwareman, Says a Maine Merchant:*

I think the consolidation will be a protection to the legitimate Hardware dealer and do away, in a measure, with catalogue houses and small jobbers who cater for the consumers' trade.

#### *A Mississippi House Give a Number of Reasons Why the Consolidation is a Good Thing:*

We notice from your recent issues that there is much speculation with reference to the jobbers' consolidation. We are retailers and sell some few goods to general merchants. We have no fears from this consolidation of business interests. We feel that in many instances it will work good results for the retail man. It will tend

to facilitate the jobber's business when rushed and aid him in expediting his great volume of business, which must be done in season or not at all. It will in many cases afford quicker delivery of goods to the retail man, thus enabling him to buy goods in less quantity than heretofore.

We can see no signs of danger in such consolidation to the retail man. A close community of interest will necessarily spring from such enterprise, and the retail man, in our judgment, will be in closer touch with the jobbing centers and must reap a benefit from the consolidation. We feel that it will cut the jobbers' expense of doing business in the way of catalogues and advertising matter, and further lessen their expenses in reducing the great number of traveling men who now are flooding the country with similar lines. We feel that the retail man will further be benefited because the general store man will have less opportunity to buy goods in the Hardware line. We believe also that it will strike a blow at the department stores and, we hope, "run them up a tree." We favor the combine if we understand its purpose, as we think we do.

#### *From a Prominent Manufacturer:*

I have heard a great many expressions with regard to the consolidation and have read with considerable interest what has been said in *The Iron Age*. It is my opinion that the man who stays in the Hardware business as of to-day will in the end be better off.

### TRADE ITEMS.

THE PECK, STOW & WILCOX COMPANY, manufacturers of Tools, Machines and General Hardware, are said to have bought the entire plant of the Brittan & Mathes Company, Pittsburgh, Pa., manufacturers of Builders' Hardware and kindred lines of goods. It is believed to be the intention to transfer the business and plant in Pittsburgh to the company's Cleveland establishment about July 1.

WILLIAM KENNEDY, manager of the African department of the Strong & Trowbridge Company, New York, sailed for South Africa May 6 on the steamer "Kronprinz Wilhelm," via England, on an extended trip throughout that territory, in the interest of certain lines with which they are closely identified.

E. D. SARGENT, for several years past the Eastern representative of the White Mountain Freezer Company, has resigned his position with that company and will hereafter be associated with the Alaska Freezer Company, Winchendon, Mass., a new corporation chartered under the laws of New Hampshire for the manufacture of Ice Cream Freezers. It is understood that Mr. Sargent will be made treasurer of the new company.

KOKOMO STEEL & WIRE COMPANY, Kokomo, Ind., are now offering the trade some designs of Farm Fencing to which they invite special attention. One of these will, it is expected, meet with much favor, as the company regard it as one of the very best Fences on the market. The new Wire plant of the company began operations May 1, and they are now turning out a full line of Barb Wire, Plain and Galvanized Wire, Nails, &c. The company refer to their plant as a most modern one, so that they are in a position to turn out an excellent quality of goods.

STORM MFG. COMPANY, Newark, N. J., manufacturers of Freight and Passenger Elevators and Dumb Waiters, incorporated on the 1st ult. under the same name, which has been the style of the concern as conducted by George W. Storm for the past 12 years. The officers of the corporation are George W. Storm, president; D. Minor Lake, treasurer, and E. B. Gilbard, secretary. The company are putting in new machinery and making arrangements to largely increase their output of goods in the Elevator and Dumb Walter line.

SAMUEL DISSTON has returned home greatly benefited in health from an extended trip on the Pacific Coast, where, with his family, he has been enjoying a well earned respite from the cares of business.

## A. J. BASSETT.

THE death of A. J. Bassett, formerly treasurer of the Grand Crossing Tack Company of Chicago, will be deplored by a wide circle of personal and business friends. Mr. Bassett died April 25, after an illness of about two years. He was better known to the trade through his long connection with the Grand Crossing Tack Company than through any other of his business relations. He removed to Chicago about 1870 to assume the duties of Western sales agent for the Taunton Tack Company. Some time afterward he engaged with the Chicago Tack Company, of which his father, Orrin N. Bassett, was proprietor. In connection with the Messrs. Hutchinson, the present proprietors of the Grand Crossing Tack Company, in 1883 he established the business of that now well-known company. They started in a very modest way, manufacturing Tacks and small Nails on a limited scale, and gradually adding to their facilities until in the course of time they developed into manufacturers of Wire Rods, Wire Nails and other Wire products, at the same time continuing their original business of manufacturing Tacks. In the development of this business Mr. Bassett took a very important part, his



A. J. BASSETT.

thorough knowledge of the Nail trade being of very great value in establishing the commercial relations of the company. His devotion to his duties in the course of time resulted in his health being undermined, and about two years since he was compelled to retire from business activity. Mr. Bassett was a man of charming personality, possessing talents which gave him an exceptionally high social standing, and his enforced retirement from business was accompanied by unusual expressions of regret from those with whom he had come in contact.

WILLIAM B. PAULSCRAFT, who has for several years been assistant manager in New York of the Hardware Buyers' Association, has severed his connection with that organization to accept the management of the Pittsburgh office of R. K. Carter & Co., purchasing agents, 66-68 Reade street, New York. As manager of the Western office of R. K. Carter & Co., Mr. Paulscraft will have charge of the Heavy Hardware and Iron and Steel branch of their business, devoting his attention exclusively to these lines. Mr. Paulscraft has had a good training for the work through the experience gained with the Hardware Buyers' Association and his previous connection with Sargent & Co., New York, and has made many friends who will regret his departure to another field, but he will enter on his enlarged responsibilities with their best wishes for his success.

## BRITISH LETTER.

Office of *The Iron Age*, HASTINGS HOUSE, (NORFOLK ST., LONDON, W. C.)

## The Hardware Trade.

TRADE remains very much the same as last week, with if anything a slightly upward tendency. In the export departments larger orders have been received from Germany, India and the United States. The United States has been buying largely Tin Plates, Pig Iron, Guns, Vises and Anvils and certain descriptions of Saddlers' Ironmongery. The recent slump in silver caused by shipments from China in part payment of the war indemnity has produced a considerable upset in the exchanges, but trade is fairly active and the outlook favorable. A large proportion, however, of the business coming from India is on Government account. The home trade is fairly active, especially in regard to season goods. Best Locks continue in good demand, but, as before reported, for the cheaper qualities the demand is falling off very seriously. They are still working overtime in the enameled plates for advertising purposes. The Japanners also are busy. Another line in active request is Stamped Hollow Ware.

## A London View of Export Business.

A few days ago I had occasion to call upon an enthusiastic American who spends his time traveling in this country and throughout Europe in the interests of one or two large American manufacturing houses. Mention of *The Iron Age* called up happy memories, for he told me that some years ago he had participated either as first, second or third in various prizes offered by *The Iron Age*. He remembers especially obtaining a prize of \$100, which sum came very handy to the young man. His thoughts are now attuned to sterner work; and his experience of selling American goods in Europe is both peculiar and extensive. In the course of our conversation the prospects in Russia cropped up. This gentleman travels in Russia twice a year, and can therefore speak with authority. I found that, broadly speaking, he has a grievance against the American tariff—a grievance which, I may remark, is by no means peculiar to himself. I thought it well, in the circumstances, to get his views reduced to paper for the consideration of the American readers of *The Iron Age*. As our conversation was of a desultory character, with many quick transitions from one aspect of the subject to another, I asked him if he would specifically answer in writing certain questions which I would put to him in writing. Although a very busy man, he kindly consented. For various reasons he does not care to have his name mentioned. The loss is mine, for to couple his name with the views expressed would add authority. He asked me simply to refer to him under the *nom de plume* of "Clonebough." The questions I submitted to him were as follows:

1. In what way has the fiscal dispute with Russia hurt such lines of goods as those handled by you? One or two examples would make this point clear.
2. How does the American high tariff affect business in the rest of Europe, and particularly in France and Germany?
3. Would a reasonable reduction of the American tariff, to the best of your belief, induce a reciprocal reduction on the part of European nations?
4. Would you make it a general rule, if you were an American manufacturer, to appoint an agent on this side who would develop your trade for you in your own name, goods to be invoiced in your name, and so build up a connection which would be your own, a good will which, if necessary, could be transferred to another agent?
5. Do you find yourself seriously prejudiced by capriciousness of supply on the part of your American principals, or, to put it more accurately, on the part of a number of firms whom otherwise you would represent if only they would supply promptly and respect their agency terms?

It will be observed from what follows that these questions are not answered *seriatim*, but they are all answered either directly or by implication in the general body of comment which "Clonebough" has written. Without further preface, then, here is the answer to the examination paper cited above:



**Clonebough's Comments.**

"America for the Americans" has been our guiding principle in framing our tariff, and a good principle it was and it will be, if we are only satisfied with protecting our interests, and if we are not using this principle for the purpose of building up a fence around our beautiful country too high to allow us to look over it from within and to see the rest of the world; for if we do, we shall find some day that our neighbors have done the same thing, and we shall be isolated. Our protective tariff has accomplished what we wanted: it has built up our industries, and to-day they are as strong as any in the world, and we are on an equal or on a better footing with the rest of the world. So far we have done right; we have been patriotic; we have built up our country, and we have the finest country in the world, and we may well feel proud of it. Our neighbors see the wonderful progress we have made; they admire our progress. Our friendship is a valuable asset for any nation, and the friendship of all nations is a most valuable asset for us.

But they can see the result of our protectionist policy, which has made us great, and they will profit by this our example, and the tendency in every European country is a protective one, because we can undersell them with our superior resources and our improved machinery—at least we once could! But we are beginning to lose ground. American machinery and methods have found their way into European countries, and unless we advance with them we must lose the business, which to build up has been the work of years.

About a year ago we had a dispute with Russia about a cargo coming from that country and on which we had levied duties which seemed unjust to that country. How little diplomacy can help the merchant or manufacturer, when those who make our laws commit errors, is shown by this incident. Deputations and committees have been in Washington urging upon the Government the necessity of relief, but to-day the duties raised on American tools in Russia in retaliation for this alleged wrong are in force, and every American tool or machine pays 5 cents per pound more duty in Russia than the same tool made in Germany, England or any other country. This is like giving away our business in that important country; or, if we want to protect our interest, it means donating our profits or more to the Russian Government.

The dignity of governments cannot mend the mistakes of our lawmakers. These methods will do for manufacturers whose goods have no merit, who have no claims upon the merchants or users by reason of the superior quality of their goods or the special character of their products but cheapness. But if manufacturers have the intention to build up their foreign business on a substantial basis, with merit, character and high quality to back it, they must choose one of three ways to accomplish their end—viz., through the exporter from the United States or the importer in foreign countries, or through their own representative in foreign countries. One of the three only. Representation in foreign countries is the surest road to success. The representative learns the foreign requirements, credits and conditions. But the representative must be above the level of local connections, which create jealousy, and should be supported by stocks of quick supply.

American tariff legislation has been actually disastrous to America, as far as the Russian export business is concerned. Germany is now following the Russian example, and with the new German tariff taking effect next spring, we shall have to record our second loss. I hope that reciprocity will meet the danger, but if the loss is to be averted there is no time to be lost. Agricultural machinery and tools need now the protection of our diplomats and not that of high duties. If we can carry our manufactured products thousands of miles across the seas and sell them in foreign markets at a profit, competing with foreign goods, or if we can sell them because they are liked better than foreign goods, does any manufacturer fear that our own people will buy foreign made goods at home, even if offered cheaper than our own?

Does the American Saw manufacturer, who sells his Saws successfully in Europe, fear the competition at home of the European Saw maker with whom he can

compete in foreign lands, paying ocean freights and duty? No; by the success of our exports we have proved that our manufactures have passed the nursery stage, and that they can stand on their own merits.

The American manufacturer has a peculiar understanding of the export business and its possibilities. I have repeatedly been told by representative makers that they care little for the export business during times of prosperity in the States, and that the orders are only accepted in the expectation of dull times at home when foreign connections may prove of value. I know, too, manufacturers to whom the export trade is of more value than the home trade, but invariably these houses are making a superior grade of goods, and recognize the necessity of sending abroad only such goods as will bear rigid inspection and are superior in workmanship and finish. Their name is known in every market abroad as well as at home, and inspires confidence in merchant and user.

Importers and exporters cannot build up such a reputation for the makers, because their object is to reap for themselves the benefit of their own enterprise. The importer is careful to conceal the name of the maker, so that business gained will remain with him. He is hiding the identity of the maker, whose name naturally does not appear in his publications, and he destroys the traces which might bring together the maker and the foreign merchant. When the importer and maker part company the maker must start over again, as his name is unknown. For the importer this self-protection is but natural. He cannot be blamed, because he has no protection in the enterprise, and therefore he cannot protect the maker. Perhaps he has introduced your goods in a certain district at large expense; some merchant in the district discovers the maker, instantly crosses to the States, and by making a large purchase gets concessions from the maker even better than the importer himself can obtain. This happens frequently. It means for the manufacturer loss of reputation; he loses one customer to gain another, but it does not increase his export business. It does not secure to the manufacturer a name and a reputation, which constitute the foundation of success both at home and abroad.

An ideal instance is before me. A. has had a representative in a city in Europe for a number of years. He is established and known everywhere to make the highest grade of Tools. A splendid organization is at his command, and his travelers and representatives cover every European country. With him have joined two other concerns, B. and C., makers of related lines, all doing business under their own names, while all accounts are collected by A., who pays to B. and C. agreed prices, taking upon himself all responsibility as to credits and established prices. At the same time he agrees to sell no lines conflicting with those of B. and C. Once a year B. and C. receive a list of customers to whom their goods have been introduced. For very large business A.'s representative makes sales f.o.b. New York in the name of B. and C., who collect themselves for such business, paying a small commission to A. for such service. A. makes a point to praise the name of B. and C., with the result that the name of B. and C. is being built up, so that when the time comes, if ever, for a separation, B. and C. have a reputation and a list of customers to continue themselves. Both are delighted with the arrangement, and the interests of A., B. and C. are identical. This same house have been willing to take in a few more related lines, but have not been able to give them admittance for various reasons, mainly because the correspondents utterly failed to understand the plan. Their objections were that they had good business in some parts which they could not part with, not seeing that by having their own office with A. they would not have to lose it, but would get more. Others insisted on big initial orders from A., whose experience taught him that no stock could be put in warehouse before being satisfied by a few actual direct sales that the goods were quite satisfactory and calculated to meet European requirements. Others could not break away from the importer and exporter, failing to see that A. could keep and increase even this source of business and had to insist on exclusive representation for European business. Others

had to be dropped, because they took orders but failed to fill them promptly. But B. and C. still enjoy the company of A. Their names appear on A.'s door; all inquiries are referred to A., who, of course, superintends their European business. The result is most gratifying, and their business being in American goods is not prejudiced by local jealousies.

These terse comments are not the reckless opinions of a shallow theorist. "Clonebough" has had personal experience of everything of which he writes. I would especially draw attention to the very practical suggestion he makes at the end of his communication as to co-operation in pushing export trade. There are, I should say, half a dozen Americans who make London their headquarters, with an intimate experience of European trade both in regard to requirements and credit, who could undoubtedly, with justice to their present principals, push the sale of related goods. I have repeatedly urged in these columns the importance of getting into touch with agents of this description. I trust that what "Clonebough" has said will encourage American manufacturers in the belief that if their export business is to be established on a permanent basis, it is not to be done by intermittent effort, but by the steady concentration of effort which can only be secured by placing their interests in the hands of a well approved agent on this side of the Atlantic. I abstain from any comment upon the question of reciprocity. The opinion of "Clonebough" on this point will, of course, carry its own weight with it.

#### English and American Clocks.

It may not be known by New York exporters that a large number of English Hardwaremen stock cheap Clocks. It is not uncommon to see in English Hardware papers prominent advertisements inserted by Clock manufacturers. This seems a point worthy of attention in America. The Birmingham correspondent of *Commercial Intelligencer* gives some useful information on this point:

Many and varied as are the industries which give employment to the artisans of Birmingham, it is not generally recognized that Clock making is one of the most important of them. Clerkenwell is popularly supposed to be the center of the English timepiece making industry. But, as a matter of fact, a large proportion of the thousands, one might even say millions, of Clocks which are annually turned out in this country are made in Birmingham. Outside Birmingham there are comparatively few Clock makers, perhaps the only factory of any considerable size being at Liverpool. Perhaps the best known specialty of the Birmingham Clock makers is the diminutive timepiece known in the trade by its registered name of the Gnat. Made throughout by Birmingham hands, it is placed on the market at the retail price of 2 shillings 2 pence. Thus by a few pence it beats its Yankee rival, a Clock of similar size styled the Bee. The latter is produced by the Ansonia Company at their big Clock works in New York, and it is sold by the English shop keeper for 2 shillings 6 pence. The English and American makers between them capture the bulk of the trade, at any rate in this particular line of Clocks. The Germans cut in to a very fair extent, but the factors give the preference to the English and American makes. Dealers familiar with the trade assert that the Birmingham Clock of its kind, and at the price at which it is sold, is far better than any other on the market.

#### How to Capture Russian Trade.

The managing director of a large business connected with the iron and coal industries, and who has close relations with Russia, says that for a large number of articles of daily consumption Germany will always have the advantage where Russia is concerned, because of her contiguity, and that for this reason the total volume of trade done by each nation will always be in favor of the Continental power. But he adds that, for machinery, articles of *luxe*, agricultural appliances, carriages, horses and other commodities, which are not required for hand to mouth consumption, England has a fair field, and the main factor that operates in favor of Germany in these departments is the question of traveling. The German manufacturer, even if he be only in the fifth rank, will often spend a larger sum upon this item than a hundred British concerns of a similar category; and, although the results are not always immediate, they usually produce a crop of business in the long run. He declares that Russia is to be won easily and won only by industrial travelers and vernacular price-lists. This advice has been given for the benefit of British exporters, but of course is equally applicable to American.

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## Letters From the Trade.

*Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.*

### Syndicate Buying.

WE are in receipt from a gentleman prominently connected with jobbing interests of the following letter. Our correspondent criticises, it will be seen, the system of syndicate buying, especially for small merchants, on the ground that it necessitates the purchase of larger quantities than their trade requires. It is obvious that this objection does not apply to syndicate buying for the larger houses, who use the system much more generally than do the retailers:

The whole foundation of syndicate buying rests upon the claim of lower prices, because of increased quantities, without taking into account the serious disadvantages, especially to the small dealer, which accrue from this method.

The difference in price, depending entirely upon the quantity, necessitates, usually, the taking of more goods than the buyer would purchase under ordinary conditions. This means capital locked up, upon which interest charges must be figured, deterioration by being kept on the shelves, and the chance of dead stock, should taste change, or an improved article be brought forth, for it usually takes a very large quantity to obtain a very small difference in price.

Thus one of the first principles of success is violated—that of turning over stock frequently and of keeping the capital constantly employed. Undue importance is thus given to one branch of the business—that of buying—at the expense of other matters of equal moment.

The most pressing need is to sell the goods and to see that the assortment is complete and the stock full. Attention to these things pays better than time devoted to an extra 5 per cent. obtained at the cost of more goods than can be disposed of in a reasonable time.

The dealer who depends upon a syndicate buyer finds it impossible to keep his stock as complete and well assorted as if he depends upon jobbers who carry full stocks, as a rule. Should one jobber be short he can easily draw his needed supplies from some other jobber, while in the case of the syndicate buyer, he has to wait until sufficient specifications have accumulated to secure a certain price. Meanwhile he is out of the goods and losing valuable sales.

Few dealers realize how costly it is to have overstocks, or dead stocks, of items that are out of date, and how unwise it is to take as assets articles that are fit only for the scrap pile.

Rather than shop from one seller to another, incurring delays and mixed stocks, it is far better to have one certain source of supply, where goods can be had promptly, so that the dealer can devote his time to keeping a clean, well assorted stock, and to making profits on his sales.

### The Grading of Prices.

As touching on the principle on which it is desirable that prices should be made by manufacturers for the different classes of trade we have the following communication from a leading Hardware merchant of Missouri. It will be seen that our correspondent advocates making prices for the two great classes of wholesale and retail merchants in which the question of quantity will not be allowed to enter:

I have read with decided interest the recent articles in your columns in regard to manufacturers' grading of prices. This is a subject of vital importance and should be agitated with clear reason and thought. If something on that line is not done pretty soon, our trade—that is, the regular Hardware trade—will die out. Let the manufacturer recognize three classes of

customers, wholesaler, retailer and consumer, and regulate his price accordingly. Quantity price must not be considered. If one wholesaler buys a single carload of goods he should buy it at the same rate as another who has a trade that justifies him in buying two or five carloads. If the party who can buy so largely would use his present advantage in price as a direct gain, well and good; but nine times out of ten it is used to make trade; in other words, the large jobber cuts the market price. This same principle must be carried out in the case of the retailer. A dealer becomes a retailer whenever he sells direct to the consumer, and hence in justice he is not entitled to jobbers' price. Quantity is not to be considered. Same way with the third customer, the consumer. Then things will be changed for the better.

### Interpretation of Contract.

From a well-known jobbing house we are in receipt of the following inquiry relating to the interpretation of contract for the purchase of goods. They will be pleased to have the opinion of the trade in the matter:

The parties concerned would like your opinion as to the merits of the following controversy. If you think that the same would be of interest to your subscribers, you can consider yourself at liberty to publish.

A is a manufacturer and sells his wares to B, a jobber, and enters into a contract with him to sell his goods at a trade discount of 25 per cent., terms 60 days net, or 5 per cent. cash discount. In the agreement is a clause reading:

It is further agreed by the party of the first part (A), that at the end of each year during the term of this agreement the following rebates shall be credited to the account of the party of the second part (B): If the amount of the annual net sales in the territory mentioned in clause 1 shall reach a total in excess of ——— thousand dollars, a rebate of five (5) per cent.; if the total shall reach in excess of ——— thousand dollars, a rebate of seven and one-half (7½) per cent.

B purchases the required amount of goods of A to entitle him to the 7½ per cent. rebate, and at the end of the year receives a credit memo from A for the amount of the rebate, but from this amount A deducts 5 per cent., claiming the cash discount on the rebate.

A argues his case as follows:

*First.*—If a jobbing discount of 25 and 7½ per cent. is deducted from the regular prices of the manufacturer, should not the cash discount be taken from the net prices after deducting the jobbing discount?

*Second.*—If the cash discount is deducted from the net amount of bills on which a jobbing discount of 25 per cent. has been allowed, should not the extra jobbing discount of 7½ per cent., which is allowed at the end of the year, be figured simply on the net amount of the account after deducting the 25 per cent. and 5 per cent. cash discount?

B claims:

*First.*—That the 7½ per cent. should be paid him on the "annual net sales" to him after deducting the 25 per cent., and regardless of the 5 per cent. cash discount, for the reason that the 5 per cent. is not a trade discount, but simply a bonus for paying cash, which B has the privilege of taking advantage of or not as he chooses.

*Second.*—That the 7½ per cent. cannot be termed a jobbing discount (as A refers to it), but that it is a rebate contingent upon B purchasing a certain amount of goods, and if A takes 5 per cent. from the amount of the rebate, it is not in reality a 7½ per cent. rebate.

We should like to know which is the correct view of the case.

Western Wind Mill & Hardware Company, wholesale and retail dealers in Wind Mills, Hardware and Water Supply Material, have purchased the Hardware and Wind Mill business of Burton-Lingo Company, Midland and Big Springs, Texas, and of Johnson & Collins, Colorado, Texas, and will continue the business at all three points. The company have a paid up capital of \$60,000.

## HIBBARD, SPENCER, BARTLETT & CO.'S GROWTH.

THE business of Hibbard, Spencer, Bartlett & Co., Chicago, has increased heavily during the past four years. They are now handling practically double the volume of business they enjoyed in 1898. At that time this house ranked among the very largest Shelf Hardware jobbers in the United States, so that the doubling of the sales of such an establishment must be considered a rather remarkable achievement. Their facilities have been so overtaxed by the great growth of their trade that they have found themselves compelled to secure much more space to accommodate the large stock which they are now obliged to carry. They began last year to make arrangements to adequately handle their increased business, and also to provide themselves with room for the further expansion which seems reasonably assured. The work thus far accomplished in this direction consists of the erection of a very large warehouse, just completed, to be used for the storage of much of their stock and for carload shipments. Additional facilities are to be furnished by the erection of a second large building, which will be used for clerical headquarters and small lot shipments, as well as for securing more storage room.

The new warehouse which has just been completed and is now being occupied is situated on North Water street, east of St. Clair street, and occupies a ground space of 127 feet in width, while its length is 460 feet on one side and 420 feet on the other, as the lot is of irregular shape. The ground plan is shown herewith, Fig. 1. The building is a structure of far more than ordinary strength, having massive brick walls, exceptionally heavy girders and floors sufficient to easily carry any load that under all possible circumstances could be placed on them. It was the aim of the company to guard against any danger of a collapse, or even the slightest settling of the building with the stock of heavy goods which must be carried. No less than 2700 50-foot piles were driven to form the foundation for this building. The walls are all laid in cement instead of mortar. The first and second floors are supported by 10 x 14 inch joists resting on 10 x 18 inch girders arranged in pairs on cast iron columns. The floors consist of 4-inch plank with a surface of 1-inch hard wood. It is unquestionably the strongest warehouse in Chicago.

The building consists of four stories and a basement, each having an area of  $1\frac{1}{4}$  acres. The basement is not only cemented, but is also provided with platforms on which even polished goods can be stored without danger of dampness or rust. The ground floor has a driveway 35 feet in width running the whole length of one side of the building, shown in Fig. 2. This width is clear of posts, as the upper floor is supported on heavy steel plate girders, 48 inches high, 22 inches wide and 35 feet long, each weighing 7 tons, which span the driveway. This driveway is completely inside the building, is paved with brick and enables a large number of teams to be handled at the same time and without getting in each other's way. While the driveway is on the street level, the floor of this building is on a level with a wagon bed or with the floor of a car. A railroad track passes through the front of the building, as shown in Fig. 3, on the opposite side from the driveway, and emerging through the side, then continues the full length of the structure, a projecting roof covering the cars and enabling them to be loaded or unloaded without exposing goods to the weather. This railroad track is of a sufficient length to hold 11 cars at one time.

Doors of an ingenious design are used along the side of the building facing the railroad track. These are shown in Figs. 4 and 5. Practically the entire side of the building can be thrown open by means of these doors to enable cars to be loaded or unloaded at any point. The doors are constructed in two horizontal parts, being hinged in the center. They open upward from the bottom, the movement being facilitated by a counterweight and by roller bearings placed at the bottom of the door and resting on the door frame. When pushed upward the hinges in the center permit the door to fold inwardly and thus the entire opening can be made available. The

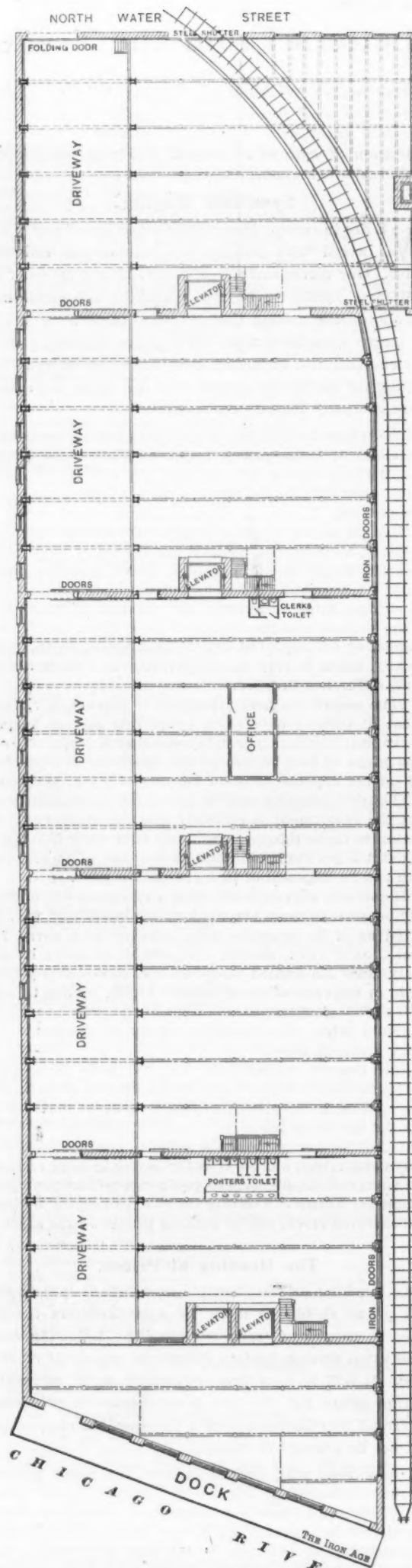


Fig. 1.—Ground Plan of Warehouse.



upper half of each of these doors is glazed with Wire Glass.

The building is constructed in five sections, each section being separated from those adjoining by means of a



Fig. 2.—The Driveway for Teams.

massive fire wall. Every possible precaution against fire has been adopted. The walls are pierced with openings on every floor, which are protected by automatic fire doors. The entire building is equipped with a



Fig. 3.—Railroad Entrance to the Building.

sprinkler system and the elevators are all inclosed in heavy brick shafts. The stairways are further inclosed with trap doors, which automatically open and close.



Fig. 4.—Hinged Doors Opening Along the Railroad.

Everything requiring power is controlled by electricity. Even the sprinkler system is thus controlled, and is the only one in Chicago thus operated.

The building is equipped with five electric elevators, each having a platform 8 x 10 feet, thus making them of ample size and capacity for any work they may be required to perform. Of these elevators two are placed toward the rear of the building for the purpose of enabling goods to be expeditiously handled to and from vessels. All have their machinery on the roof in penthouses, thus taking no valuable interior space, which is a great advantage. The vertical hoist with no intervening sheaves also saves wear and tear on both the engine and the rope.

While all floors are abundantly lighted by side windows, the top floor receives additional light from 30 skylights arranged at frequent intervals.

The rear of the building abuts on the Chicago River



Fig. 5.—Section Along the Railroad.

and has a fine dock. Goods can be trucked from this dock by means of an inclined passageway directly into the basement, or *vice versa*. The doors opening on this dock are of the same character as those used on the side of the building. A very large space is arranged between these doors and the elevators, as shown in Fig. 6, in which goods can accumulate while being handled in and out.

The railroad track which extends through this ware-



Fig. 6.—Portion of Dock Receiving Room.

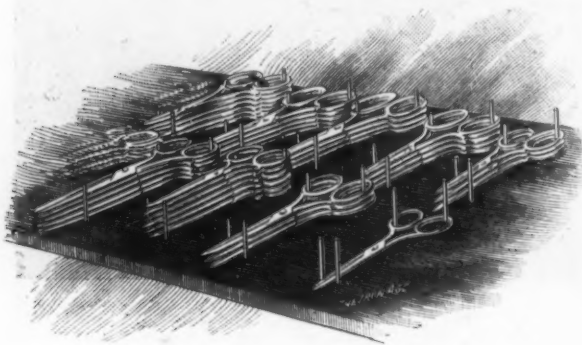
house is connected with the Chicago & Northwestern system, and through it with the railroad system of Chicago. The company, however, will operate a number of lighters on the river, by means of which they will be enabled to easily deliver goods by water to any of the railroad freight stations thus accessible. These lighters will also be used as a convenient means of transportation between the warehouse and the company's new main store building, which is now in process of construction on the opposite side of the Chicago River between Wabash avenue and State street. This building will occupy the entire block lying between South Water street and the river, and will have ten stories and a

basement, each with an area of close to 1 acre. Upon its completion, which is expected to be on or before May 1, 1903, the company will abandon their present quarters at Lake street and Wabash avenue which they have occupied for so many years.

Completion of the new warehouse will enable the company to consolidate under one roof the storage facilities which are now divided between two buildings. One of these is a warehouse on Michigan street, which consists of six stories and a basement and covers a ground space of 110 x 120 feet. The other is the second story of the Barry Warehouse, in the same locality, whose dimensions are 50 x 400 feet.

### ARRANGEMENT OF SHEARS IN SHOWCASE.

**M**ANY merchants experience difficulty in keeping Shears and Scissors in order when in the showcase. The simple plan adopted by Stephen W. Woodbury, Northampton, Mass., removes all excuse for disorder. As shown in the illustration, the Scissors of each size and style are kept in separate piles, those in each pile



*Arrangement of Shears in Showcase.*

being held in position by four Wire Nails, the heads of which have been cut off.

The blades are held in place by two of these Nails, one on each side of the blades. Another Nail is put within one of the bows at the near end, while the fourth Nail is placed within the other bow at the far end. The board on which the Scissors and Shears are exhibited is covered with black plush, which sets them off with very good effect.

### MISCELLANEOUS NOTES.

#### A New Belt Cement.

Kneisser & Co., 916 Summit street, Toledo, Ohio, have recently put on the market a cement for thoroughly sticking together greasy or dirty belts. No pegs, rivets or sewing is necessary, it is explained, when using the cement. It is prepared in a dry form for marketing, put up in 1, 2, 3 and 5 pound packages, and is also sold in bulk. It is alluded to as standing any climate, and as not being affected by heat, cold or dampness. The cement has been used on belts from 2 inches up to 87 inches in width.

#### The Emerson Electric Mfg. Company.

The Emerson Electric Mfg. Company, 714-718 St. Charles street, St. Louis, Mo., have issued a booklet entitled "Emerson Fans and Why We Recommend Them," which has been prepared with the express object of helping dealers sell fan motors. The booklet is addressed to the consumer and is written as though it came from the dealer. The name and address of the dealer sending out the book will be printed on the cover. All orders will be filled only through dealers, as the company do not sell direct to consumers. The company issue a larger illustrated catalogue devoted to fan motors and ceiling fans. In addition, a collection of bulletins in book form are being distributed. These relate to goods not covered by the illustrated catalogue, and include alternating and direct current power motors, exhaust fans, forge blowers, electric water pumps, auto-

matic illumination cylinders or revolving switches, electric hack saws, &c.

#### George Callahan & Co's Specialties.

George Callahan & Co., 218 Front street, New York, have since 1887 manufactured, among other specialties, Acme tempering oil, liquid core compound and steam and pipe joint cement. Referring to the tempering oil, the firm state that it has no odor in use, that it has a high fire test and that it is lower in price than whale or fish oil. It is made in three densities to suit different purposes, and is not affected by cold weather. The steam joint cement is a dry powder, to be mixed with boiled linseed oil, to be used on flange, tank, union and screw joints, also in connection with rubber or copper gaskets. The cement is alluded to as standing 500 pounds pressure and as contracting and expanding with the metal. The liquid core compound is used to make perfect cores for all kinds of castings of iron, steel or brass. It is stated that it saves waste, has no offensive smell or smoke, leaves clean core boxes, can be used with all kinds of sand and is always ready for use by simply mixing with sand.

#### Duplex Gin Saw Sharpener.

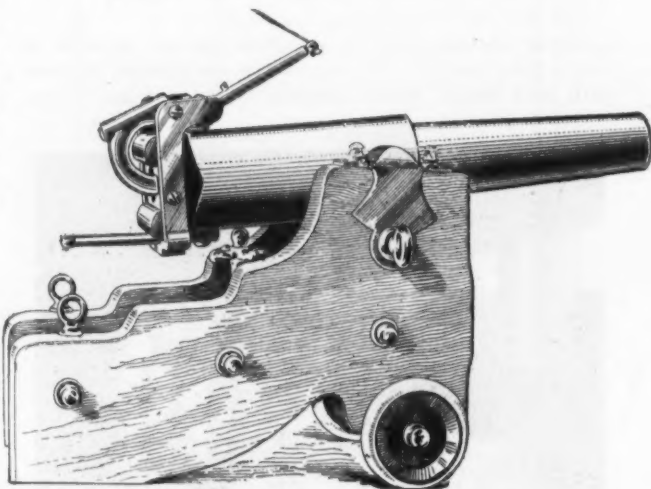
The A. A. Wood & Sons Company, Atlanta, Ga., are about bringing out a new type of their Duplex gin saw sharpener. We are advised that this machine has been sold for years in the South and has also had considerable sale in Egypt and other foreign countries. The company look forward to a heavy sale during the approaching season.

#### Aspinwall Cotton Sprayers.

The Aspinwall Mfg. Company, Jackson, Mich., are manufacturing cotton sprayers for use in protecting cotton from grasshoppers, careless worms, spring web worms, the leaf or army worm and the Mexican boll weevil. The sprayers are mounted on wheels, to be drawn by horses, and are supplied with barrel and nozzles for holding and spraying insecticide. The sprayers are made of different sizes and capacities, some carrying two barrels and others one barrel. The sprayers are also adapted for spraying potato vines, tobacco, tomato, cabbage and other plants.

#### The Reliable Single Barrel Saluting Gun.

The accompanying illustration represents a saluting gun placed on the market by Barney & Berry, Spring-



*The Reliable Single Barrel Saluting Gun.*

field, Mass. The barrel is described as being of the toughest gun metal, thoroughly tested. The carriages are mahogany finish, thoroughly reinforced, having bronze wheels, rubbed tired. The gun is bored to take shells of standard gauge. In operation the breech block is moved to the right by means of the lever underneath the rear of the gun; the shell is then inserted and the breech



block moved to the left, where it is automatically locked in firing position. The upper or firing lever is pulled by the cord attached to it, which brings the firing pin in contact with the primer and explodes the shell. With each gun is included a canvas cover, wiping rod and gun brush. The gun is made in five sizes of bore:  $\frac{7}{8}$ , 1,  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  and  $1\frac{3}{4}$  inch. The makers refer to the superior firing mechanism, simplicity, safety and elegance of mountings.

### Oplex Coffee Mill.

Bronson-Walton Company, 1800 East Madison avenue, Cleveland, Ohio, for whom John H. Graham & Co., 113 Chambers street, New York, are direct repre-

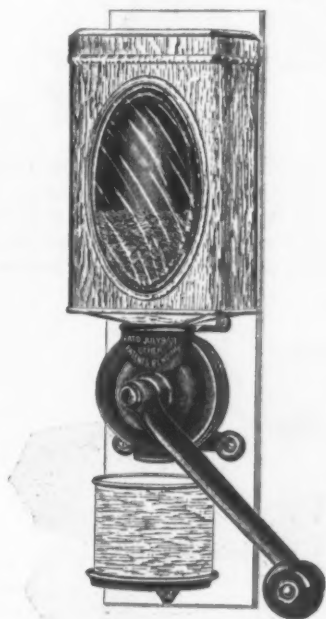


Fig. 1.—Oplex Double Grinder Mill and Canister.

sentatives, are now introducing their Oplex coffee mill, as here illustrated. This is a square canister of sheet steel, lacquered inside to prevent rust and lithographed outside in antique oak design. The heavy oval glass is pressed into the front and held there by a steel band. The canister holds one pound of whole coffee practically

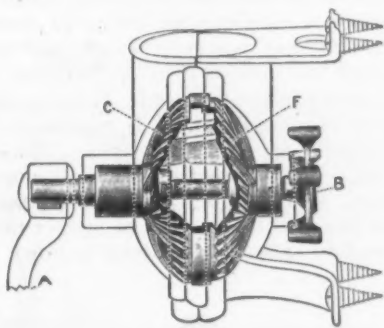


Fig. 2.—Sectional View of Double Grinder.

air tight, and the contents are visible through the glass. A strong iron bracket holds the cup for receiving ground coffee. The cup is tin, lithographed outside to match the canister. The grinding parts, shown in Fig. 2, are machine finished so that they turn easily and smoothly, and the grinding nuts can be adjusted so as to grind from coarse to very fine. In operation the bean descends from the canister over the front grinder C and the rear grinder F and drops when ground into the cup below. Adjustment for the grade of coffee desired is obtained by turning the thumb screw at the back. By means of the double grinder the grinding capacity is increased two fold. The mill is varnished oak pattern and each one is packed in a carton.

### McCabe Parlor Door Hanger.

McCabe Hanger Mfg. Company, 532-542 West Twenty-second street, New York, have brought out the McCabe parlor door hanger No. 10, for sliding doors, as here illustrated. The track is made of cold drawn steel with a parallel slot having flanges on both sides, formed in a way to get the greatest carrying capacity of the

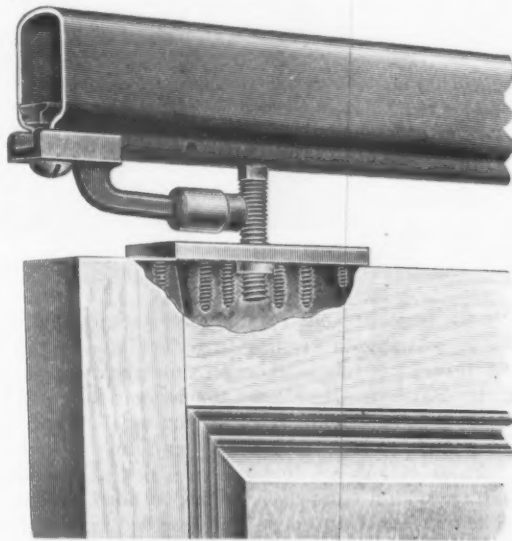


Fig. 1.—McCabe Parlor Door Hanger No. 10.

steel, together with the smoothest traveling surface for the carriage, with the least possible friction. There is an adjustment on the track, and by means of the screw pendant on the carriage there is also an adjustment on the door, which is referred to as a great convenience. The carriage has ball bearings, fiber wheels, and the various parts are case hardened. The manufacturers call particular attention to the new adjustable stop that is used in connection with this hanger, which is shown in Fig. 1. This stop is adjustable at any point, and it is said will save at least an hour's time in putting up every set of hangers. This hanger is intended to satisfy the demand for a simple, durable and noiseless door hanger that can be sold profitably at a price within the reach of

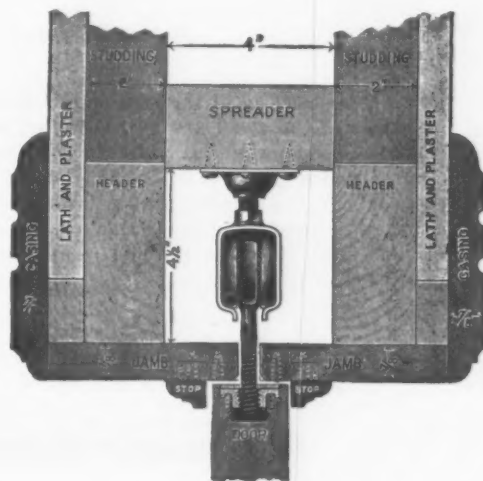


Fig. 2.—Cross Section of Hanger, Track and Frame.

the speculative builder. Fig. 1 shows a section of the track with the hanger secured to the door and the adjustable stop. Fig. 2 is a cross section view of the hanger, which shows the method of securing both track and carriage to the different parts.

W. H. Munson, Woodbury, Conn., has been succeeded in the Hardware business by Strong & Munsell.

### The Reliable Door Hanger.

A hanger designed for sliding doors has been brought out by the Allith Mfg. Company, 1325 Monadnock Block, Chicago, Ill. A tubular track has been specially devised for it. The hanger is particularly well adapted to very heavy doors or to doors which require freedom of movement, such as usually is attained through hinged hang-

it fits tightly into the adjoining pieces and thus holds them in line.

### The Buffalo Improved Ventilator.

The Buffalo Forge Company, Buffalo, N. Y., have recently put on the market the improved ventilator shown herewith. This ventilator is designed to provide a free

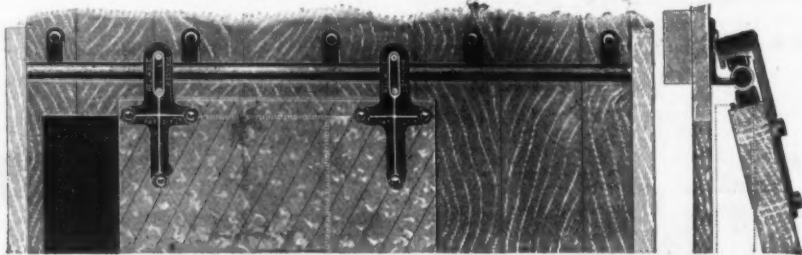


Fig. 1.—The Reliable Door Hanger.

ers. By its peculiar construction this hanger enables a door to be swung out from 4 to 5 feet on the bottom without injury to the hanger or the track, as shown in Fig. 1. This cut also shows the hanger in use. The hanger consists of a malleable casting, as shown in Fig. 2, having two rollers, one above and one below the track. These rollers are inclosed in a box at the top of the casting, which comprises an upper hood and lower cup. The cup has a drainage hole, and both are notched to receive the axles of the roller. The upper roller is a cast iron spool, machine finished, having an axle of

exit for impure air in the building, while at the same time, it is stated, effectually preventing the air re-entering the building through the ventilator. It is explained that with the movement of air across the head of the ventilator a suction is produced which draws the air



Fig. 2.—The Reliable Hanger Casting.

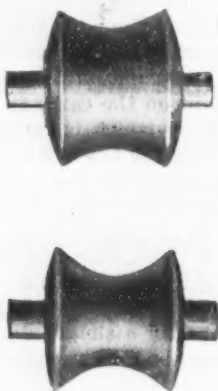


Fig. 3.—Upper and Lower Rollers.

cold rolled steel, shouldered to fit the slots in the hanger. Between the axle and the spool are 13 cold rolled steel rollers, which make it easy running. The lower roller is a malleable casting, also spool shaped, which runs in the slots of the lower cup. This roller prevents the hanger jumping the track or binding if the corner of the door should jump up. Fig. 3 shows the upper and lower rollers in relative position. The track, Fig. 4, consists



The Buffalo Improved Ventilator.

from the room. The sucking action is obtained because of the shape and construction of the ventilator head. The ventilators are built of heavy galvanized iron to resist any reasonable strain which may come upon them. They are referred to as being silent in their work and do not require the expenditure of power, which in some instances means a considerable outlay of money each week. When buildings require both light and ventilation such conditions are met with by a ventilator specially constructed with a glass top head. It loses none of its good qualities as a ventilator. It is remarked, with the additional quality of supplying light. These special ventilators may be constructed either of copper, brass or steel plate, or they may be made of the regular material and lined with pure lead to protect the ventilator when used to exhaust obnoxious or other injurious



Fig. 4.—Track for Reliable Hangers.

of a heavy sheet steel tube, formed over a mandrel. The shape of this track, it is remarked, makes it much stronger than a flat track of equal weight, and it cannot be dented or bent. A  $\frac{3}{8}$ -inch slot along one side of the track allows the insertion of the track supports, which are of malleable iron, cast with a double disk of such dimensions that they have a driving fit in the tubular track. This double disk makes it possible to use the supports interchangeably at splices and between them. One support will hold the track at a splice perfectly, as

fumes. The ventilators are also used to prevent down drafts and smoky chimneys. The usual method of applying the ventilators to a chimney is with the outside flange, which forms a protection for the top of the chimney and is a rigid and desirable method of fastening.

P. W. Ziegler has succeeded Ziegler & Doran in the Hardware, Stove and Sporting Goods business in Manhattan, Kan.



**Classic Food Chopper.**

The Griswold Mfg. Company, Erie, Pa., are putting on the market the new patent Classic food chopper, an illustration of which is given herewith. Two special points of excellence in this article are referred to as the drip spout, which carries the juice from the back of the cutter to the front into the dish, and the effective table clamp with which the chopper is equipped, which is claimed to be a great improvement over the old round clamp. These choppers are made in two sizes, with a capacity of 2 pounds and 2½ pounds of meat per minute respectively. In designing the Classic chopper the company state that they endeavored to make a machine



Classic Food Chopper.

embodying the best features found in others, with several valuable improvements. The face of the chopper being convex and the knife machined to exact fit, always seats the knife in the right place, giving a fine, clean cut. In cutting juicy fruits any leak in the back end on the floor is avoided by the patent drip spout attachment. All parts are made strictly interchangeable, and the castings are smooth and well tinned. The manufacturers claim that this machine does not mash or choke up, but cuts cleanly. It is adapted for use with all kinds of vegetables and fruits. Each chopper is furnished with three cutters—coarse, medium and fine. The weight of the No. 1 chopper is 4½ pounds, and of the No. 2, 5 pounds. They are furnished packed six in a case.

**Columbia Caliper No. 15.**

E. G. Smith, Columbia, Pa., is placing on the market the double jaw caliper shown herewith. It is referred to as two calipers in one, and as a new departure in sliding calipers, making the work much easier for those having to fit parts together. If, for instance, the user has a



Columbia Caliper No. 15.

gear or pulley to fit to a shaft, the shaft may be measured with the long jaws, when the upper short jaws will indicate the exact size the hole may be; or by measuring the hole the long jaws will indicate the size of the shaft. This tool, it is pointed out, obviates the necessity of using two calipers by adding the thickness of the jaws, such calculations often causing mistakes. The caliper is now made only in the 6-inch size, with the long jaws 1¾ inches long, the short jaws 1¼ inches long, with jaws 3-16 inch thick.

**Gem Safety Razor.**

The Gem Cutlery Company, 33 Reade street, New York, have recently brought out an improved form of their Gem safety razor, illustrations of which are here given, showing the principal features to which the attention of the trade is drawn. Fig. 1 shows the safety frame partly open for cleaning and the automatic blade regulator raised from the body of the frame. Fig. 2 in-



Fig. 1.—Safety Frame Partly Open.

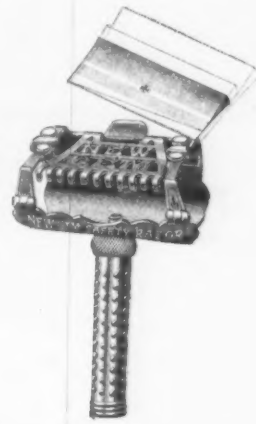


Fig. 2.—How Various Sizes of Blades Can Be Used.

icates how three safety blades of various sizes, two of which are shown in outline, can be used with this design of frame without any special adjustment being necessary, thus making the razor suitable for even the most inexperienced user. If the blades are not exactly of uniform size, or, if they have been reground a number of times, it requires skill in getting the proper adjustment, a difficulty which this style of frame overcomes. Fig. 3 is a full view of the razor with blade, frame and handle ready for use. Fig. 4 is a view of the front of the frame, open. These razors are nicely put up in lithographed tin



Fig. 3.—Gem Safety Razor Complete.



Fig. 4.—Full View of Razor Open.

boxes and the blade held in a metal container, to prevent injury to the cutting edge; the frame complete and handle for holding blade when stropping in the same way as an ordinary razor being packed in a round tin box, while the blade and container are put up in a flat covered tin box and the two held together by a label. They also make a separate automatic stropping machine for holding the blade when stropping on a swing strop. These razors are put up in a large variety of leather cases, holding various numbers of blades, &c., all of which are fully explained in a pamphlet catalogue of 24 pages, printed in English, German, French, Spanish and Russian. With a certain moderate assortment of these goods the company give a display case free to dealers, which is suitable for counter display and to sell from, it being reached from the back, the beveled front being glass with a miniature barber pole on each of the two ends.

### Noppel Force and Suction Pump.

Noppel Pump Company, Hartford Trust Company Building, Hartford, Conn., are manufacturing the Noppel plumbers' pump, here illustrated. Fig. 1 shows one form of the pump, Fig. 2 representing a similar pump, but with additional features by which to accomplish similar results in other ways. These pumps are designed for clearing out obstructions of grease or other impediments in pipes connected with sinks, basins, bathtubs, closets, urinals, &c., without scratching or otherwise marring the fittings. In cleaning out obstructions in the waste pipes referred to no connection is needed other than to screw onto the neck of pump a suction cup provided for that purpose and place the cup over the outlet of the bowl, holding it there firmly. The water should be allowed to run into the basin until it covers the other opening in the pump (see Fig. 1), at the bottom of the right hand side. The handle of the pump should then be turned to the left as far as it will

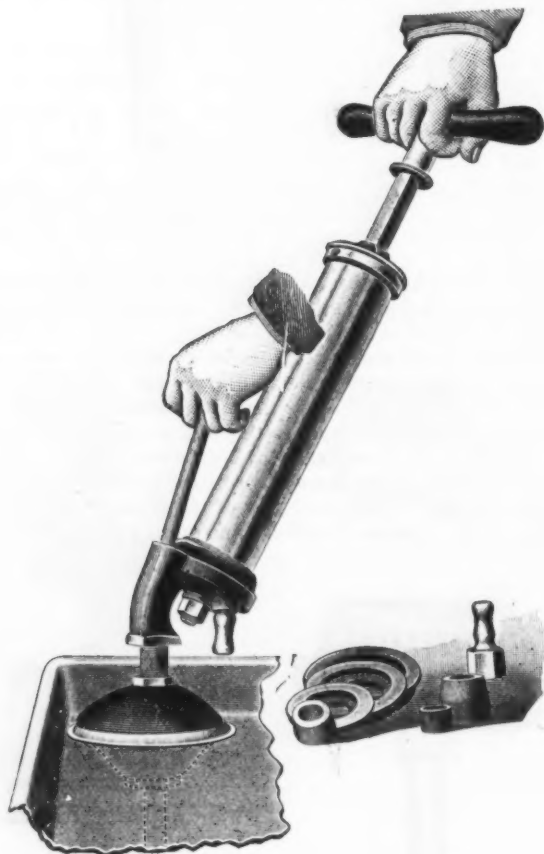


Fig. 1.—Noppel Force and Suction Pump.

go and pulled up. This fills the pump cylinder from the water in the basin. The handle should then be turned to the right as far as it will go and forced down and pulling it up as far as possible, keeping the handle turned to the right. This forces the water drawn from the basin against the obstruction and sucks it out again. After a few strokes the handle can be stopped at the end of the upward stroke, when the handle can be turned to the left as far as it will go and pushed down, thus discharging what has previously been drawn up. There should then be taken in a fresh supply of water or solution of chlorate of lime, which acts as a solvent with grease, and pulling the handle up again, turn to the right as far as it will go and renew pumping up and down vigorously. It is said that it is seldom necessary to repeat the operation, as usually by this time the obstruction has been opened up so that the water the operator is pumping in is running through the pipe before it can be drawn back again. Where it is necessary to exert more force the suction cup can be taken off and put on the neck of the pump, on which it is screwed through the hole in the foot rest, and the pump fastened with the nut provided. The brass nipple is then screwed on and a rubber hose long enough to reach from the

pump to the outlet in the basin attached. On the other end of the hose can be fitted the male nipple, to which should be screwed the cup. A short hose connected with the opening in the base of the pump should be allowed to lie in a pail holding the water or solution and standing conveniently near, as illustrated in Fig. 2. The pump is then ready for operation as before, but without the necessity of filling the bowl or basin with water, although if the pipe is completely clogged it is always advisable to allow the water in the faucet to



Fig. 2.—Another Method of Using the Pump.

run until the pipe is filled from the obstruction to the intake. When it is more convenient to operate on the end of the pipe or some part of the plumbing other than the waste pipe entrance the operation is the same as last described, but one of the rubber plugs which are furnished, fitting pipes from  $\frac{3}{4}$  inch to 3 inches in diameter, is screwed onto the male nipple in place of the cup and forced into the opening to make a tight joint. It will thus be seen that this pump acts both for force and suction work.

### Winchester Smokeless Breech Caps.

The Winchester Repeating Arms Company, New Haven, Conn., and 312 Broadway, New York, have recently perfected a conical bullet breech cap loaded with smokeless powder and the Winchester greaseless bullet. These cartridges are very accurate at the ranges they are designed for. A desirable feature is their being loaded with Winchester greaseless bullets, made of a special alloy, which makes a lubricant unnecessary. By doing away with the lubrication on the bullet one of the prime causes of the deterioration of the powder is removed and the accuracy, reliability and keeping qualities of the cartridges greatly increased. It also prevents fouling of the barrel; and the cartridges are much cleaner to han-



Winchester Smokeless Breech Cap.

dle. On this account the manufacturers believe that these cartridges will soon enjoy the same popularity that the Winchester .22 short and .22 long rim fire cartridges loaded with smokeless powder and Winchester greaseless bullets do. Although only recently introduced, there has been a large demand for them by shooters, who have long been looking for a .22 caliber cartridge that would be clean to handle and would not quickly foul the barrel.

French-Hansen-Whittle Hardware Company have succeeded French & Hansen, at Harlan, Iowa.



# Current Hardware Prices.

REVISED MAY 6, 1902.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33½@33¼@10% signifies that the price of the goods in question ranges from 33½ per cent. discount to 33¼ and 10 per cent. discount.

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (April 4, 1901), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters Blind—

Domestic, 7 doz. \$3.00...33¼@33¼@10%  
North's...10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent...25¢55  
Taplin's Perfection...25¢55

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—American—

Arm and Hammer, Wrought...\$18.00@24.00  
Buel's Patent, Trenton...\$18.00@24.00  
Eagle Anvils...\$18.00@24.00  
Hay-Budden, Wrought...\$18.00@24.00  
Horseshoe brand, Wrought...\$18.00@24.00

## Imported—

Peter Wright's...\$18.00@24.00

## Anvil, Vise and Drill—

Millers Falls Co., \$18.00...20%

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths—

Hull Bros. Co.  
Lots of 1 doz...25%  
Smaller Lots...20%  
Lots of 3 doz...30%

## Augers and Bits—

Com. Double Spur...70¢@70¢10%

Boring Machine Augers...70¢@70¢10%

Car Bits, 12-in. twist...60¢@60¢10%

Jennings' Pattern

Auger Bits...50¢10¢5@10%

Ford's Auger and Car Bits...40¢10%

Forster Pat. Auger Bits...25%

C. E. Jennings & Co.

No. 10 ext. lip. R. Jennings' list...40%

No. 30. R. Jennings' list...50%

Russell Jennings...25¢10¢2@2%

L'Honnemieu Car Bits 13¢10¢13¢10¢5%

Mayhew's Countersink Bits...45%

Pugh's Black...20%

Pugh's Jennings' Pattern...35%

Snell's Auger Bits...60%

Snell's Bell Hangers' Bits...60¢10%

Snell's Car Bits, 12-in. twist...60%

Wright's Jennings Bits (R. Jennings' list)...50%

## Bit Stock Drills—

Standard List...65¢@65¢5%

## Expansive Bits—

Clark's small, \$18; large, \$26...50¢10%

Lavigne's Clark's Pattern, No. 1...\$1.00

doz., \$26; No. 2, \$18...50¢10%

C. E. Jennings & Co., Steer's Pat...33¢5%

Swain's...60%

## Gimlet Bits—

Common Double Cut, gro. \$2.25@2.75

German Pattern...gro. \$4.00@4.75

## Hollow Augers—

Bonney Pattern, per doz. \$11.00@11.50

Ames...25¢10%

New Patent...25¢10%

Universal...20%

Wood's Universal...25%

## Ship Augers and Bits—

Ford's...40%

Snell's...40%

C. E. Jennings & Co.

L'Honnemieu's...15¢13¢

Watrous...40%

## Awl Hafts, See Hafts, Awl.

## Awls—

Brad Awls:

Handled...gro. \$2.75@3.10

Unhandled, Shouldered...gro. \$2.00@2.50

Unhandled, Patent...gro. \$2.00@2.50

Peg Awls:

Unhandled, Patent...gro. \$1.00@1.50

Unhandled, Shouldered...gro. \$1.00@1.50

Scratch Awls:

Handled, Common...gro. \$3.50@4.00

Handled, Socket...gro. \$11.50@12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First Quality, factory brands...\$6.00

First Quality, jobbers' brands...\$5.75

Second Quality...\$5.00@5.25

## Axle Grease—See Grease, Axle.

## Axles—

Concord, Loose Collar...45¢@50¢

Concord, Solid Collar...45¢@50¢

No. 1 Common...35¢@40¢

No. 1 & 2 Com. New Style...35¢@40¢

No. 2 Solid Collar...45¢@50¢

Nos. 15 to 18...70¢@75¢10%

Nos. 15 to 18...75¢@75¢10%

Nos. 19 to 22...75¢@75¢10%

Boxes, Axle—

Common and Concord, not turned...lb. 45¢@45¢

Common and Concord, turned...lb. 45¢@45¢

Half Patent...lb. 80¢@80¢

Pullman's...lb. 80¢@80¢

Spring Balances—

Spring Balances...50¢10¢60%

Chatillon's

Light Sng. Balances...40¢10%

Straight Balances...40%

Circular Balances...50%

Large Dial...30%

Pelouze's...50%

Barb Wire—See Wire, Barb.

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb...24¢@30¢

Beams, Scale—

Scale Beams, List Jan. 12, '92...40¢10%

Chatillon's No. 1...30%

Chatillon's No. 2...40%

Beaters—Egg—

Standard Cap...\$4.50

No. 0 Rap d...\$4.50

No. 10 Dover Family Size...\$3.00

No. 15 Dover Hotel Size...\$15.00

Rival...\$9.00

Taplin Mfg. Co.

No. 60 Improved Dover...\$4.50

No. 75 Improved Dover...\$7.50

No. 75-2 Imp'd Dover, Tin'd...\$9.00

No. 100 Improved Dover...\$8.00

No. 102 Improved Dover, Tin'd...\$9.50

No. 150 Improved Dover, Hotel...\$15.00

No. 152 Imp'd Dover, Hotel...\$17.00

Lyon's Standard size...\$1.75

Wonder (S. S. & Co.)...\$7.50

Bellows—

Blacksmith, Standard List...70¢@70¢10%

C. E. Jennings & Co., Blacksmith...60¢10%

C. E. Jennings & Co., Hand...33¢5%

Blacksmiths—

Inch...30 33 36 39 40

Each \$3.50 3.75 4.25 4.50 5.35 6.15

Extra Length:

Each \$4.00 4.55 5.10 5.60 6.10 7.50

Molders—

Inch...9 10 11 12 14 16

Doz...\$6.75 7.35 8.50 9.50 12.00 14.50

Hand—

Inch...6 7 8 9 10 12

Doz...\$3.75 4.25 4.50 5.00 5.7 6.75

Bells—Cow—

Ordinary goods...75¢5@75¢10%

High grade...70¢@70¢10%

Jersey...75¢10%

Texas Star...50%

Door—

Abbe's Gong...45%

Barton Gong...55%

Horn, R. & E. Mfg. Co.'s...55¢10%

Lover and Pull, Sargent...40¢@40¢10%

Yankee Gong...35%

Hand—

Hand Bells, Polished...60¢5@60¢10%

White Metal...55¢@55¢10%

Nickel Plated...30¢@50¢10%

Swiss...80¢@80¢10%

Silver Chime...33¢@33¢10%

Miscellaneous—

Farm Bells...lb. 2¢@2¢40%

Steel Alloy Church and School...50¢10¢@60%

National Bell Foundry Co.

Superior Cast Steel Church and School Bells...50¢10¢@60%

Willnot & Hobbs Mfg. Co. Gongs...70%

Belting—Rubber—

Agricultural (Low Grade)...75¢10@80%

Common Standard...75¢@75¢10%

Standard...70¢@70¢10%

Extra...60¢10¢5%

High Grade...80¢10¢@10¢5%

Boston Belting Co.

Seamless Stitched, Imperial...45¢5%

Boston...50¢5%

Nagara...60¢5%

Leather—

Extra Heavy, Short Lap...50¢10@60%

## Regular Short Lap—

Standard...60¢10@65¢10%

Light Standard...65¢@70%

Leather Lacing...60¢10%

Cotton—

Rossendale-Reddaway B. & H. Co.

Sphinx Brand...60¢10%

Durable Brand...70%

Bench Stops—See Stops, Bench

Benders and Upsetters,

Tire—

Green River Tire Benders and Upsetters...20%

Stoddard's Lightning Tire Upsetters,

No. 1, \$3.75; No. 2, \$6.50; No. 3, \$9.50;

No. 4, \$14.75.

Bicycle Goods—

John S. Long's Son's 1899 list:

Chain...50%

Parts...50%

Spokes...50%

Tubes...60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—

See Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Ad-

justers, Blind.

Blind Fasteners—See Fas-

teners, Blind.

Blind Staples—See Staples,

Blind.

Blocks—Tackle—

Common Wooden...70¢10@75%

Cleveland & Teel...60¢10@70%

Ford's Star Brand Self Lubricating...60¢10%

Hollow Steel, Ford's Pat. Star Brand...50¢10%

Lane's Patent Automatic Lock and

Junior...30%

Stowell's Novelty, Mal. Iron...50¢10%

See also Machines, Hoisting.

Boards Stove—

Zinc, Crystal, &c...40¢@40¢10%

Boils—

Carriage, Machine &c.—

Common, list Feb. 1, '92...60¢5@...

Norway Iron, \$3.00, list Jan. 1, '93

Phila. Eagle, \$3.00 list May 24, '99...80¢@80¢5%

Bolt Ends, list Feb. 14, '95...70¢5@...

Machine, list Oct. 1, '99...65¢5@...

Machine with C & T Nuts...65¢7½@...

NOTE.—Jobbers are in many cases un-

derstating the manufacturers.

Door and Shutter—

Cast Iron Barrel, Round Brass

Knob:

Inch...3 4 5 6 8

Per doz...\$0.26 .30 .39 .47 .55

Cast Iron Spring Foot:

Inch...6 8 10

Per doz...\$1.00 1.25 1.75

Cast Iron Chain, Flat, Japanned:

Inch...6 8 10

Per doz...\$0.75 1.05 1.30

Cast Iron Shutter, Brass Knobs:

Inch...6 8 10

Per doz...\$0.57 .80 1.00

**Cartridges—**

Blank Cartridges:	
32 C. F., \$5.50.....	10¢5%
32 C. F., \$7.00.....	10¢5%
32 cal. Rim., \$1.50.....	10¢5%
32 cal. Rim., \$2.75.....	10¢5%
B. B. Caps, Con., Ball Stgd.....	\$1.40
B. B. Caps, Round Ball.....	25¢
Central Fire.....	15¢10%
Target and Sporting Rifle.....	15¢10%
Primed Shells and Bullets.....	50¢
Rim Fire Sporting.....	15¢5%
Rim Fire Military.....	15¢5%

**Castors—**

Bed.....	70¢10¢@70¢10¢5%
Plate.....	75¢10¢@75¢10¢5%
Philadelphia.....	75¢10¢@75¢10¢5%
Boss.....	70¢10%
Anti-Friction.....	70¢10%
Martin's Patent (Phenol).....	45¢
Payson's Anti-Friction.....	70¢10¢10%
Standard Ball Bearing.....	45¢
Tucker's Patent low list.....	30¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain, Coil—**

American Coil, Jobbers' Shipments:	
5-16 1/4 5-16 3/4 7-16 1/4 9-16	
8-70 6-35 5-30 4-50 4-20 4-25	
1/2 3/4 1 1 to 1 1/4 inch.	
1.10 4.15 4.15 1.15 per 100 lb.	
Less than Cash lots add 25¢.	
German Coil.....	60¢10¢10%

**Halters and Ties—**

Halter Chains.....	60¢10¢@60¢10¢10%
German Halter Chain, list July 21, '97.....	60¢10¢@60¢10¢10%
Cow Ties.....	60¢60¢5%

**Trace, Wagon, &c.—**

Traces, Western Standard: 100 pair	
6 1/2-6-3, Straight, with ring.....	\$30.00
6 1/2-6-2, Straight, with ring.....	\$31.00
6 1/2-6-2, Straight, with ring.....	\$35.00
6 1/2-10-2, Straight, with ring.....	\$38.00
Add 2¢ per pair for Hooks.	
Twist Traces 2¢ per pair higher than	
Straight Link.....	
Trace, Wagon and Fancy Chains.....	50¢10¢@50¢10¢5%

**Miscellaneous—**

Jack Chain, list July 10, '93:	
Iron.....	60¢10¢@60¢10¢10%
Brass.....	60¢10¢@60¢10¢10%
Safety Chain.....	70¢5¢@70¢10%
Gal. Pump Chain.....	lb. 4@4 1/2¢
Covert Mfg. Co.:	
Breast.....	35¢25¢
Heel.....	35¢25¢
Heel.....	35¢25¢
Keln.....	35¢25¢
Stallion.....	35¢25¢
Covert Sud. Works:	
Breast.....	70¢
Halter.....	70¢
Fold Back.....	70¢
Rein.....	70¢
One da O'm-ni-ty:	
Am. C. H. Halters.....	40¢45¢5%
Am. Cow Ties.....	45¢50%
Eureka Coll and Halters.....	45¢50¢5%
Niagara Coll and Halters.....	45¢50¢5%
Niagara Cow Ties.....	45¢50¢10¢5%
Wire Dog Chains.....	45¢50¢5%
Wire Goods Co.:	
Dog Chain.....	60¢10%
Universal Dbl-Jointed Chain.....	60¢10%
Chalk—(From Jobbers.)	
Carpenters' Blue.....	gro. 12¢@15¢
Carpenters' Red.....	gro. 37¢@40¢
Carpenters' White.....	gro. 33¢@35¢

**See also Chalks—****Chalk Lines—See Lines.****Checks, Door—**

Bardley's.....	40¢10%
Columbia.....	60¢10%
Ellipse.....	60¢80¢10%
Chests, Tool—	
American Tool Chest Co.:	
Boys' Chests, with Tools.....	55¢
Yachts' Chests, with Tools.....	40¢
Gentlemen's Chests, with Tools.....	30¢
Farmers', Carpenters', etc., Chests,	
with Tools.....	30¢
Machinists' and Pipe Fitters' Chests,	
Empty.....	50¢
C. E. Jennings & Co.'s Machinists' Tool	
Chests.....	30¢

**Chisel**

Socket Framing and Firmer	
Standard List.....	70¢70¢10%
Buck Bros.....	30¢
Charles Buck.....	30¢
C. E. Jennings & Co. Socket Firmer	
No. 10.....	60¢10%
C. E. Jennings & Co. Socket Framing	
No. 15.....	61¢10%
Swan's.....	70¢5%
L. & J. White.....	30¢30¢5%
Tanged—	
Tanged Firmers.....	40¢5¢@40¢10%
Back Bros.....	30¢
Charles Buck.....	30¢
C. E. Jennings & Co. Nos. 191, 181.....	35¢
L. & J. White, Tanged.....	25¢5%

**Cold**

Cold Chisels, good quality, lb. 13¢@15¢	
Cold Chisels, fair quality, lb. 11¢@12¢	
Cold Chisels, ordinary.....	lb. 8¢@9¢
Chucks—	
Beach Pat., each \$8.00.....	30¢
Massey's Planer and Milling.....	15¢20%
Pratt's Positive Drive.....	25¢
Empire.....	25¢
Blacksmiths'.....	25¢
Skinner Patent Chucks:	
Combination Lathe Chucks.....	40¢
Drill Chucks, Patent and Standard.....	25¢
Drill Chucks, New Model.....	25¢
Independent Lathe Chucks.....	40¢
Improved Planer Chucks.....	25¢
Universal Lathe Chucks.....	40¢
Face Plate Jaws.....	40¢
Standard Tool Co.:	
Improved Drill Chuck.....	45¢
Union Mfg. Co.:	
Combination.....	40¢
Cedar Drill.....	30¢
Geared Scroll.....	30¢
Independent.....	40¢
Union Drill.....	40¢
Universal.....	40¢
Face Plate Jaws.....	35¢

**Crackers, Nut—**

Little Giant.....	gr. \$34.00
Crackers—	
Grain.....	50¢
White Round Crayons, gross, 5¢@6¢	
Cases, 100 gro., \$1.50, at factory.	
D. M. Steward Mfg. Co.:	
Metal Workers' Crayons, gr. \$2.50	
Soapstone Pencils, round, flat	
or square.....	gr. \$1.50
Rolling Mill Crayons.....	gr. \$2.50
Railroad Crayons (compo-	
sition) gr. \$2.00	

**See also Chalk.**

Creamery Pails—See Pails,	
Creamery.....	

**Crocks**

Adjustable, Hammers.....	20¢20¢5%
Cabinet, Sargent's.....	50¢10%
Carriage Makers', P. S. & W. Co. 40¢10%	
Carriage Makers' Sargent's.....	50¢10%
Bealy, Parallel.....	38¢10%
Lineman's, Utica Drop Forge & Tool	
Co.....	40¢
Saw Clamps, see Vises, Saw Filers.	

**Cleaners Sidewalk—**

Star Sock, All Steel.....	\$4.00 net
Star Shank, All Steel.....	\$3.75 net
W. & C. Shank, All steel, 7 1/2 in. d. z.	\$3.05; 8 in., \$3.10; 8 1/2 in., \$3.25.

**Cleavers, Butchers'—**

Foster Bros.....	30¢
New Haven Edge Tool Co.'s.....	40¢
Fayette R. Plumb.....	33¢@35¢
P. S. & W.....	50¢50¢5%
L. & J. White.....	25¢

**Clippers—**

Chicago Flexible Shaft Company:	
Handy Toilet.....	gr. \$7.30
Mascotte Toilet.....	gr. \$3.40
Monitor Toilet.....	gr. \$9.00
Stewart's Patent.....	gr. \$10.00

**Clips Aisle—**

Eagle and Superior 1/4 and 5-16	
inch.....	70¢10%
Norway, 1/4 and 5-16 inch.....	70¢10%
Cloth and Netting, Wire	
—See Wire, &c.—	

**Cocks, Brass—**

Hardware list:	
Compression and Plain Bibbs.....	65¢@65¢10%
Globe, Kerosene, Racking, &c.	
Cocks.....	65¢10¢70%

**Coffee Mills—See Mills, Coffee.****Collars Dog—**

Brass, Pope & Stevens' list.....	40¢
Embossed, Gilt, Pope & Stevens' list.....	30¢10%
Leather Pope & Stevens' list.....	40¢

**Compasses Dividers, &c.—**

Ordinary Goods.....	75¢75¢5%
Bemis & Call Hdw. & Tool Co.:	
Dividers.....	65¢
Calipers, Call's Patent Inside.....	55¢
Calipers, Double.....	65¢
Calipers, Inside or Outside.....	65¢
Calipers, Wing.....	60¢
Compasses.....	50¢
J. Stevens A. & T. Co.....	25¢10%

**Compressors Corn Shock—**

J. R. Higgins & Co.:	
Conductor Pipe, Galva-	
—L. C. L. to Dealers:	
Territory.....	Not needed.
Eastern.....	70¢25¢10%
Central.....	65¢10¢10%
Southern.....	65¢10%
S. Western.....	60¢12 1/2¢10%
Terms: 2% for cash.	
Jobbers receive extra 12 1/2¢ on car-	
loads loose, and extra 12 1/2¢ on car-	
loads crated.	

**See also Eave Troughs.****Coolers, Water—**

Gal., each.....	1 3/4 6 8 2 30
Labrador \$1.20 \$1.50 \$1.80 \$2.10 2 30	
Gal.....	1 3/4 6 8 2 30
Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00	
Gal.....	2 3 4 6 8
Galv. Lined Ea. \$1.85 \$2.00 \$2.25 \$2.50 \$3.00	
Galv. Lined side handles	
Gal.....	2 3 4 6 8
Each.....	\$1.95 \$2.15 \$2.40 \$3.30 \$4.15, 25%

**Coopers' Tools—**

See Tools, Coopers'.	
Cord—	
Sash—	
Braided, Drab.....	lb. 25¢
Braided, White, Com. lb. 15¢@17 1/2¢	
Cable Laid Italian, lb. A, 15¢; B, 16¢	
Common India.....	lb. 9¢@9 1/2¢
Cotton Sash Cord, Twisted.....	lb. 12¢@13¢
Patent Russia.....	lb. 12 1/2¢@13¢
Cable Laid Russia.....	lb. 12 1/2¢@13¢
India Hemp, Braided.....	lb. 11¢@12¢
India Hemp, Twisted.....	lb. 10¢@12¢
Patent India, Twisted.....	lb. 10¢@12¢
Pearl Braided, cotton.....	lb. 17 1/2¢
Massachusetts, White.....	lb. 22¢
Massachusetts, D. ab.....	lb. 26 1/2¢
Eddystone Braided Cotton.....	lb. 19¢
Harmony Cable Laid Italian.....	lb. 15¢
Oswann Mills:	
Crown, Solid Braided White.....	lb. 22¢
Braided, Giant, White.....	lb. 20¢
Peerless:	
Cable Laid Italian.....	16¢
Cable Laid Russian.....	14¢
Cable Laid India.....	12¢
Braided India.....	12¢
Phoenix, White.....	15¢
Samson, Nos. 7 to 12:	
Braided, Drab Cotton.....	lb. 32¢
Braided, Italian Hemp.....	lb. 32¢
Braided, Linen.....	lb. 49¢
Braided, White Cotton, Spot.....	lb. 28¢
No. 6 cords, 1¢ extra.	
Silver Lake:	
A quality, Drab, 40¢.....	15¢
A quality, White, 35¢.....	15¢
B quality, Drab, 35¢.....	15¢
B quality, White, 30¢.....	15¢
Italian Hemp, 40¢.....	15¢
Linen, 57 1/2¢.....	15¢

**Wire, Picture—**

List Oct. 1 00.85¢10¢10¢85¢10¢10¢5%	
Note.—There is a good deal of confusion	
in lists, some using old list and others the	
above list.	

**Corn Knives and Cutters**

—See Knives, Corn.	
Corn Planters—	
—See Planters, Corn.	

**Crackers, Nut—**

Little Giant.....	gr. \$34.00
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**Cradles—**

Grain.....	50¢
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**Crayons**

White Round Crayons, gross, 5¢@6¢	
Cases, 100 gro., \$1.50, at factory.	
D. M. Steward Mfg. Co.:	
Metal Workers' Crayons, gr. \$2.50	
Soapstone Pencils, round, flat	
or square.....	gr. \$1.50
Rolling Mill Crayons.....	gr. \$2.50
Railroad Crayons (compo-	
sition) gr. \$2.00	

**See also Chalk.****Creamery Pails—See Pails,**

Creamery.....	
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**Crocks**

Adjustable, Hammers.....	20¢20¢5%
Cabinet, Sargent's.....	50¢10%
Carriage Makers', P. S. & W. Co. 40¢10%	
Carriage Makers' Sargent's.....	50¢10%
Bealy, Parallel.....	38¢10%
Lineman's, Utica Drop Forge & Tool	
Co.....	40¢
Saw Clamps, see Vises, Saw Filers.	

**Cleaners Sidewalk—**

Star Sock, All Steel.....	\$4.00 net
Star Shank, All Steel.....	\$3.75 net
W. & C. Shank, All steel, 7 1/2 in. d. z.	\$3.05; 8 in., \$3.10; 8 1/2 in., \$3.25.

**Cleavers, Butchers'—**

Foster Bros.....	30¢
New Haven Edge Tool Co.'s.....	40¢
Fayette R. Plumb.....	33¢@35¢
P. S. & W.....	50¢50¢5%
L. & J. White.....	25¢

**Clippers—**

Chicago Flexible Shaft Company:	
Handy Toilet.....	gr. \$7.30
Mascotte Toilet.....	gr. \$3.40
Monitor Toilet.....	gr. \$9.00
Stewart's Patent.....	gr. \$10.00

**Clips Aisle—**

Eagle and Superior 1/4 and 5-16	
inch.....	70¢10%
Norway, 1/4 and 5-16 inch.....	70¢10%
Cloth and Netting, Wire	
—See Wire, &c.—	

**Cocks, Brass—**

Hardware list:	
Compression and Plain Bibbs.....	65¢@65¢10%
Globe, Kerosene, Racking, &c.	
Cocks.....	65¢10¢70%

**Coffee Mills—See Mills, Coffee.****Collars Dog—**

Brass, Pope & Stevens' list.....	40¢
Embossed, Gilt, Pope & Stevens' list.....	30¢10%
Leather Pope & Stevens' list.....	40¢

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See Tools, Coopers'.	
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Sash—	
Braided, Drab.....	lb. 25¢
Braided, White, Com. lb. 15¢@17 1/2¢	
Cable Laid Italian, lb. A, 15¢; B, 16¢	
Common India.....	lb. 9¢@9 1/2¢
Cotton Sash Cord, Twisted.....	lb. 12¢@13¢



**Gates, Molasses and Oil - Stebbins**

**Gauges**  
 Marking, Mortise, etc. 50¢ to 1.00

Barrett's Comb. Roller Gauge 55¢ to 1.00  
 Stanley R. & L. Co.'s Butt & Babbit Gauge 90¢ to 1.00

Wire, Brown & Sharpe's 25¢  
 Wire, Morse's 25¢  
 Wire P. S. & W. Co. 30¢ to 1.00

**Climlets - Single Cut**  
 Nail, Metal, Assorted, gro. \$1.10 to 1.60

Spike, Metal, Assorted, gro. \$2.20 to 3.25

Nail, Wood Handled, Assorted, gro. \$1.75 to 3.00

Spike, Wood Handled, Assorted, gro. \$3.25 to 3.50

**Glass, American Window**  
 Jobbers' List, Jan. 21, 1901

From store 30¢ to 1.00

F. O. B. factory, carload lots

Single strength 10¢ to 1.75

Double strength 10¢ to 1.75

**Glue - Liquid, Fish**  
 List A, Bottles or Cans, with Brush 37½¢ to 50¢

List B, Cans (½ pts., pts., qts.) 33½¢ to 45¢

List C, Cans (½ gal., gal.) 25¢ to 45¢

International Glue Co. (Martin's) 40¢ to 50¢

**Glue Pots - See Pots, Glue**

**Grease, Axle**  
 Common Grade, gro. \$5.00 to 6.00

Dixon's Everlasting, 10-lb pails, ea. 85¢

Dixon's Everlasting, in bxs. 2 doz. 1.20

Snow Flake 1 qt. cans, per doz. \$2.00; 2 qt. \$3.20;

1 gal. cans per doz. \$6.00; 3 gal. 10.00

**Grindstones**  
 Bicycle Emery Grinder 65¢

Bicycle Grindstones, each 25¢ to 3.00

Pike Mfg. Co. Improved Family Grindstones

per inch, per doz. \$2.00 to 3.50

Pike Mower, Knife and Tool Grinder, each \$9.00

Velox Ball Bearing, mounted, Angle Iron Frames, each \$3.25

**Guards, Snow**  
 Cleve and Wire Spung Co.

Galv. Steel 1000 90.00

Copper 1000 18.00

**Cut Powder - See Powder**

**Hack Saws - See Saws**

**Hats, Axi**  
 Peg Patent, Leather Top, \$4.50 to 5.25

Peg Patent, Plain Top, \$3.50 to 3.75

Sealing, Brass Ferrule, \$1.50 to 1.60

Saddlers' Brass Ferrule, \$1.35 to 1.45

Peg, Common, \$1.25 to 1.35

Brad, Common, \$1.50 to 1.75

**Halters and Ties**  
 Covert Mfg. Co.

Web 45¢ to 50¢

Jute Rope 45¢ to 50¢

Sisal Rope 30¢ to 40¢

Covert's Saddlery Works

Web and Leather Halters 70¢

Jute and Manila Rope Halters 70¢

Sisal Rope Halters 70¢

Jute, Manila and Cotton Rope Ties 70¢

Sisal Rope Ties 60¢ to 70¢

**Hammers**  
 Handled Hammers

Heller's Machinists' 50¢ to 50¢

Heller's Farriers' 50¢ to 50¢

Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75

Peck, Stow & Wilcox 50¢ to 1.00

Fayette H. Plumb

Plumb, A. E. Nail, 33½¢ to 35¢

Engineers' and B. S. Hand 50¢ to 1.00

Machinists' Hammers 50¢ to 1.00

Riveting and Tappers' 40¢ to 75¢

Sargent's C. S. New List 40¢

**Heavy Hammers and Sledges**  
 5 lb. and under, lb. 45¢ 75¢ to 1.00

3 to 5 lb. lb. 30¢ 40¢ to 50¢

Over 5 lb. lb. 30¢ 40¢ to 50¢

Wilkinson's Smith's 94¢ to 1.00 lb.

**Handcuffs and Leg Irons**  
 See Police Goods

**Handles**  
 Agricultural Tool Handles

Axe, Pick, etc. 50¢ to 1.00

Hoe Rake, Fork, etc. 50¢ to 1.00

Shovel, etc. Wood D Handles 50¢ to 1.00

**Cross-Cut Saw Handles**  
 Atkins' 40¢ to 50¢

Champion 45¢ to 50¢

Diamond 50¢

Mechanics' Tool Handles

Auger, assorted, gro. \$2.30 to \$3.50

Brad Axl. 1.25 to 1.50

Chisel Handles

Apple Tanged Firmer, gro. ass'd. \$2.25 to \$3.35

Hickory Tanged Firmer, gro. ass'd. \$1.75 to \$2.20

Apple Socket Firmer, gro. ass'd. \$1.70 to \$1.85

Hickory Socket Firmer, gro. ass'd. \$1.60 to \$1.75

Hickory Socket Framing, gro. ass'd. \$2.50 to \$2.75

File, assorted, gro. \$1.00 to \$1.15

Hammer, Hatchet, Axe, etc. 60¢

Hand Saw, Varished, doz. 70¢ to 75¢

Not Varished, doz. 50¢ to 60¢

Plane Handles

Jack, doz. 85¢; Jack Bolted, 50¢ to 60¢

Fore, doz. 35¢ to 38¢; Fore, Bolted, 70¢ to 75¢

Nicholson Simplicity File Handle, 70¢ to 75¢

**Hangers**  
 Barn Door, New Pattern, Round Groove, Regular

Inch. 3 4 5 6 8

Barn Door, New England Pattern, Check Back, Regular

Inch. 3 4 5 6

Doz. \$1.30 1.75 2.50 3.00

Chicago Spring Butt Co.

Friction 25¢

Big Twin 25¢

Chisholm & Moore Mfg. Co. 50¢

Baggage Car Door 40¢

Elevator 50¢

Railroad 50¢

Columbian Hdw. Co. 39¢ to 41¢

American Trackless 39¢ to 41¢

Cronk Hanger Co. 60¢

Roller Bearing 60¢ to 1.00

Lane Bros. Co.

Parlor, Ball Bearing 84.15

Parlor, Standard 83.35

Parlor, New Model 82.85

Parlor, New Champion 82.85

Parlor, Standard 50¢ to 1.00

Covered 50¢ to 1.00

Special 50¢ to 1.00

Lawrence Bros.

Advance 60¢

Cleveland 70¢

Crown 90¢

New York 60¢ to 1.00

Peerless 60¢ to 1.00

McKinney Mfg. Co.

No. 1, Special \$15 60¢ to 1.00

No. 2, Standard \$15 60¢ to 1.00

Myers' Stayer Hangers 50¢ to 1.00 (net)

Stowell Mfg. and Foundry Co.

Acme Parlor Ball Bearing 40¢

Atlas 60¢

Badger Barn Door 50¢

Baggage Car Door 50¢

China Anti-Friction 40¢

Elevator 40¢

Express 40¢

Interstate 40¢

Lundy Parlor Door 50¢

Maxie 50¢

Matchless 50¢

Nash 50¢ to 1.00

Railroad 50¢

Street Car Door 50¢

Steel, Nos. 400, 404, 500, 40¢ to 1.50

Stowell Parlor Door 50¢

West West, Nos. 381, 404, 500, 50¢

Zenith for Wood Track 50¢

Taylor & Boggs Foundry Co.

Kidder's 50¢ to 1.00

Wilcox Mfg. Co.

Bike Roller Bearing 60¢ to 1.00

C. J. Roller Bearing 60¢ to 1.00

Cycle Ball Bearing 50¢

Dwarf Ball Bearing 40¢

Ives, Wood Track 60¢ to 1.00

L. T. Roller Bearing 60¢ to 1.00

New Era Roller Bearing 50¢ to 1.00

O. K. Roller Bearing 60¢ to 1.00

Prindle, Wood Track 60¢

Richards' Wood Track 60¢

Richards' Roller Bearing 60¢ to 1.00

Spencer Roller Bearing 60¢ to 1.00

Tandem Nos. 1 and 2 60¢ to 1.00

Underwriters' Roller Bearing 40¢

Velvet 50¢

Wilcox Auditorium Ball Bearing 30¢

Wilcox Barn Trolley No. 125 40¢

Wilcox Elevator Door Hanger 50¢

No. 112 and 125 50¢

Wilcox Elevator Door Hangers

No. 132 40¢

Wilcox Fire Trolley, Roller Bearing 30¢

Wilcox Le Roy Noiseless Ball Bearing 40¢

Wilcox New Century 50¢ to 1.00

Wilcox O. K. Steel Track 50¢

Wilcox O. K. Trolley 50¢

Wilcox Trolley Ball Bearing 40¢

Wilcox Wideman Narrow Gauge Ball Bearing 40¢

**Harness Menders**  
 See Menders

**Harness Snaps - See Snaps**

**Hatchets**  
 McKinney's Perfect Hap 1 doz. 50¢

Wrought Haps, Staples, etc. - See Wrought Goods

**Hatchets**  
 Best Brands 50¢ to 50¢ to 1.00

Cheaper Brands 1.00 to 60¢ to 1.00

Note - Net prices often made

**Hay and Straw Knives**  
 See Knives

**Hinges**  
 Blind and Shutter Hinges

Surface Gravity Locking Blind

(Victor; National; 1893 O. P. Niagara; Clark's O. P.; Clark's Tip; Buffalo)

No. 1 1 3 5

Doz. pair 80.75 1.45 2.90

Mortise Shutter

(L. & P. O. S. Dixie, etc.)

No. 1 1 3 5

Doz. pair 80.55 1.52 3.15

Mortise Reversible Shutter, (Buffalo, etc.)

No. 1 1 3 5

Doz. pair 80.65 1.62 3.25

North's Automatic Blind Fixture, No. 2, for Wood, \$9.00; No. 3, for Brick, \$1.50

Parker 70¢ to 75¢

Reading's Gravity 75¢ to 1.00

Sargent's, Nos. 1, 3, 5, 11 & 13 70¢ to 1.00

Stanley's Steel Gravity Blind Hinges, 1 doz. sets, without screws, \$3.00; 5 doz. sets, \$1.15

Wrightville H'dware Co.

O. S. Lull & Porter 80¢ to 90¢

Acme, Lull & Porter 75¢ to 1.00

Queen City Reversible 75¢ to 1.00

Stenger's Positive Locking, Nos. 1 & 2 70¢ to 1.00

Shepard's Noiseless, Nos. 60, 65, 55, 70¢ to 1.00

Niagara Gravity Locking, Nos. 1, 3 & 5 75¢ to 1.00

1898, Old Pat'n, Nos. 1, 3 & 5 75¢ to 1.00

Tip Pat'n, Nos. 1, 3 & 5 75¢ to 1.00

Buffalo Gravity Locking, Nos. 1, 3 & 5 75¢ to 1.00

Shepard's Double Locking, Nos. 20 & 25 70¢ to 1.00

Champion Gravity Locking, No. 75 75¢ to 1.00

Steamboat Gravity Locking, No. 10 75¢ to 1.00

Pioneer, Nos. 600, 45 & 51 75¢ to 1.00

Empire, Nos. 101 & 103 70¢ to 75¢

W. H. Co.'s Mortise Gravity Locking, No. 2 80¢ to 1.00

**Gate Hinges**  
 Clark's or Shepard's - Doz. sets:

No. 1 1 2 3

Hinges with Latches 31.50 1.90 2.65

Hinges only 31.50 1.90 2.65

Latches only 31.50 1.90 2.65

New England:

With Latch doz. \$1.55

Without Latch doz. \$1.25

Reversible Self-Closing:

With Latch doz. \$1.90

Without Latch doz. \$1.45

Western:

With Latch doz. \$1.50 to 1.75

Without Latch doz. \$0.95 to 1.20

Wrightsville H'dware Co.

Shepard's or Clark's, doz. sets, No. 1 2 3

Hinges with Latches 31.50 2.00 2.75

Hinges only 1.20 1.50 2.10

Latches only 35 45 50

**Spring Hinges**  
 Holdback, Cast Iron, gro. \$8.00 to 9.50

Non-Holdback, Cast Iron, gro. \$7 to 7.50

Myers' Noiseless Store Ladders.....50%  
**Ladies'—melting—**  
 L. & W. Mfg. Co.....25%  
 P. S. & W.....50%  
 Reading.....60%  
 Sargent.....40%  
**Lanterns—Tubular—**  
 Regular Tubular.....doz. \$4.50@4.75  
 Light Tubular.....doz. \$4.75@5.25  
 Hinge Tubular.....doz. \$4.75@5.25  
 Other Styles.....doz. \$4.75@5.25  
**Bull's Eye Police—**  
 No. 1, 3 1/2 inch.....\$3.60  
 No. 2, 3 inch.....\$4.00  
**Latches, Thumb—**  
 Roggin's Latches.....doz. \$0.30@0.35  
**Lawn Mowers—**  
 See Mowers, Lawn.  
**Leaders Cattle—**  
 Small.....doz. 50c; large, 55c  
 Covert Mfg. Co.....45%  
**Lemon Squeezers—**  
 See Squeezers, Lemon.  
**Lifters, Transom—**  
 Solid Grip, Payson Mfg. Co.....80%  
 It & E.....45%  
**Lines—**  
 Wire Clothes, Nos. 18 19 20  
 100 feet.....\$2.20 2.00 1.65  
 75 feet.....\$1.80 1.70 1.30  
**Ossawa Mills.**  
 Crown Solid Braided Chalk.....33%  
 Mason's, No. 0 to No. 5.....33%  
 Samson Cordage Works:  
 Solid Braided Chalk, No. 0 to 3.....40%  
 Silver Lake Braided Chalk, No. 0, \$6.00;  
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50;  
 No. 4, \$8.00; No. 5, \$8.50.....40%  
**Locks—Cabinet—**  
 Cabinet Locks.....35%  
**Door Locks, Latches, &c.—**  
 [Net prices are very often made on  
 these goods.]  
 Reading Hardware Co.....50%  
 R. & E. Mfg. Co.....50%  
 Sargent & Co.....40%  
**Elevator—**  
 Stowell's.....40%  
**Padlocks—**  
 Wrought Iron.....75c@1.00@1.25  
 R. & E. Mfg. Co. Wrt. Steel and Brass 50%  
**Sash, &c.—**  
 Fitch's:  
 Bronze and Brass.....66%  
 Iron.....70%  
 Ives' Patent:  
 Bronze and Brass.....62%  
 Iron.....65%  
 Wrought Bronze and Brass.....55%  
 Wrought Steel.....60%  
 Payson's Signal.....80%  
 Reading.....60%  
**Machines—Boring—**  
 Common, Upright, Without Augers, \$2.00  
 Common, Angular, Without Augers, \$2.25  
 Without Augers.  
 R. & E. Mfg. Co.: Upright, Angular.  
 Improved No. 3, \$1.25 No. 1, \$1.00  
 Improved No. 4, 3.75 No. 2, 3.38  
 Improved No. 5, 2.75  
 Jennings'.....2.50 3.00  
 Miller's Falls.....5.75  
 Snell's, Rice's Pat. 2.50 3.75  
 Swan's, No. 500, 5.10 No. 900 6.45  
**Hoisting—**  
 Moore's Anti-Friction Differential Pul-  
 ley Block.....30%  
 Moore's Hand Hoist, with Lock Brake, 20%  
 Moore's Portable Pneumatic Hoist.....25%  
**Ice Cutting—**  
 Chandler's.....15%  
**Washing—**  
 Wayne American.....doz. \$28.00  
 Western Star, No. 2.....doz. 28.00  
 Western Star, No. 3.....doz. 30.00  
 St. Louis, No. 41.....doz. 60.00  
**Mallets—**  
 Hickory.....45%  
 Lignumvite.....50%  
 Timmers', Hickory and Applewood,  
 doz.....50%  
**Mats—Door—**  
 Elastic Steel (W. G. Co.).....10%  
**Mattocks—**  
 See Picks and Mattocks.  
**Meat Cutters—**  
 See Cutters, Meat.  
**Milk Cans—See Cans, Milk**  
**Mills—Coffee—**  
 Enterprise Mfg. Co.....25%  
 National, 1st Jan. 1, '94.....30%  
 Parker's Columbia and Victor.....30%  
**Parker's Box and Slide.....**  
 Swift, Lane Bros Co.....30%  
**Mining Knives—**  
 See Knives, Mining.  
**Molasses Gates—**  
 See Gates, Molasses.  
**Money Drawers—**  
 See Drawers, Money.  
**Mowers Lawn—**  
 Net prices are generally quoted.  
 Cheap.....all sizes, \$1.90@1.25  
 Good.....all sizes, \$2.25@2.50  
 10 12 14 16-inch  
 High Grade 4.25 4.50 4.75 5.00  
 Continental.....60%  
 Great American.....70%  
 Quaker City.....70%  
 Pennsylvania.....70%  
 Pennsylvania Horse.....50%  
 Pennsylvania Pony.....45%  
 Philadelphia:  
 Styles M., S., C., K., T.....70%  
 Style A, all Steel.....60%  
 Style E, Low Wheel.....60%  
 Style E, High Wheel.....70%  
 Drexel and Gold Coin, low list.....50%  
**Nails—**  
 Cut and Wire. See Trade Report.  
 Wire Nail and Brads, Papered.  
 List July 30, 1899 85c@1.00@1.10  
 Hungarian, Finishing, Upholster-  
 ers', &c. See Tacks.

**Horse—**  
 Nos. 6 7 8 9 10  
 A. C.....25% 23% 22% 21% 21%.....40%  
 Ausable.....25% 24% 23% 24% 23%.....50%  
 C. B. K.....25% 25% 22% 21% 21%.....40%  
 Champlin.....25% 25% 25% 24% 23%.....40%  
 Clinton.....19% 17% 16% 15% 14%.....30%  
 Maud S.....25% 23% 22% 21% 21%.....50%  
 Putnam.....23% 21% 20% 19% 18%.....33%  
 Vulcan.....23% 21% 20% 19% 18%.....25%  
 American, Nos. 5 to 10.....50%  
 Neponset.....Nos. 5 to 10.....12%  
 Jobbers' special brands.....per lb. 8@9c  
**Picture**  
 1 1/2 2 2 1/2 3 3 1/2 in.  
 Brass Head.....45c 60c 70c 95c 1.00 gro.  
 Por. Head.....1.10 1.10 1.10 .. gro.  
**Nippers, See Pliers and Nippers.**  
**Nut Crackers—**  
 See Crackers, Nut.  
**Nuts—**  
 Cold Punched.....Off list.  
 Mfrs. or U. S. Standard.  
 Square, plain.....\$4.70@4.80  
 Hexagon, plain.....\$4.90@5.00  
 Square, C. T. & R.....\$4.90@5.00  
 Hexagon, C. T. & R.....\$5.20@5.40  
 Hot Pressed:  
 Mfrs., U. S. or Nar. Gauge Stan'd.  
 Square Blank.....\$5.00@5.10  
 Hexagon Blank.....\$5.30@5.40  
 Square Tapped.....\$4.80@4.90  
 Hexagon Tapped.....\$5.10@5.20  
**Oakum—**  
 Best or Government.....lb. 6c  
 Navy.....lb. 6 1/2c  
 U. S. Navy.....lb. 6 1/2c  
 Plumbers' Spun Oakum.....24c  
 In carload lots 1/4 lb. off f.o.b. New  
 York.  
**Oil Axle—**  
 Snow Flake:  
 1 pt. cans, per doz.....\$3.00  
 1 qt. cans, per doz.....\$4.80  
 1 gal. cans, per doz.....\$15.00  
 5 gal. cans, per doz.....\$68.00  
**Oil Tanks—See Tanks, Oil.**  
**Oilers—**  
 Brass and Copper.....40c@1.00@1.25  
 Tin or Steel.....60c@1.00@1.25  
 Zinc.....60c@1.00@1.25  
 Paragon:  
 Brass and Copper.....40c@1.00  
 Tin or Steel.....60c@1.00  
 Zinc.....60c@1.00  
 Malleable, Hammers' Improved, No. 1,  
 \$3.00; No. 2, \$4; No. 3, \$4.40 per doz. 20%  
 Malleable, Hammers' Old Pattern,  
 same list.....30%  
 Willmot & Hobbs Mfg. Co.:  
 Spring Bottom Cans.....70c@1.00  
 Railroad Oilers etc.....60c@1.00  
**Oponers—Can—**  
 French.....doz. 35c  
 Iron Handle.....doz. 25c@27c  
 Sprague, Iron Hdl., per doz 35c@40c  
 Sargate Scissors.....doz. \$1.75@3.00  
 Tip Top.....per doz. \$0.75  
 National, per gro.....\$1.75@2.00  
 Stowell's.....per doz. 35c@45c  
 Waldorf, per gro.....\$3.65  
**Egg—**  
 Nickel Plate.....per doz., \$2.25  
 Silver Plate.....per doz., \$3.50  
**Packing—**  
 Asbestos Packing, Wick and Rope,  
 15@15 1/2 lb.  
**Rubber—**  
 Sheet, C. I.....8@12c  
 Sheet, C. O. S.....9@13c  
 Sheet, C. B. S.....10@14c  
 Sheet, Pure Gum.....50@70c  
 Sheet, Red.....35@40c  
 Jenkins' Standard.....35@40c  
**Miscellaneous—**  
 American Packing.....70c@1.00 lb.  
 Cotton Packing.....15@16c lb.  
 Italian Packing.....9@12c lb.  
 Jute.....3 1/2@4c lb.  
 Russia Packing.....7@11c lb.  
**Pails—Creamery**  
 S. S. & Co., with gauges.. No 1 \$0.50;  
 No. 2, \$0.75 per doz.  
**Galvanized—**  
 Price per doz.  
 Quart.....10 12 14  
 Water, Regular.....1.75 2.00 2.25  
 Water, Heavy.....3.50 3.60 3.80  
 Fire, Rd. Bottom.....2.50 2.50 3.00  
 Well.....2.50 3.00  
**Pans—Dripping—**  
 Standard List.....50c@1.00@1.25  
**Fry—**  
 Common Lipped:  
 No. 1 2 3 4 5  
 Per doz. \$0.60 .75 .85 .95 1.15  
**Roasting and Baking—**  
 Regal, S. S. & Co., per doz. Nos. 5, \$4.50;  
 10 \$5.00; 20 \$5.50; 30 \$6.00.  
 Simplex, per gro. No. 40 \$30.00; 50,  
 \$34.50; 60 \$39.00; 140, \$33.00; 150,  
 \$37.50; 180, \$43.00.  
**Paper-Building Paper—**  
 Asbestos:  
 Building Felt.....lb.  
 Mill Board, sheet, 4 1/2 x 10 inches.....3c  
 Mill Board, roll, thicker than 1-16  
 inch.....3c  
 Mill Board, roll, 1-16 in. thick and  
 less.....3c  
 Rosin Sized Sheathing: Per roll  
 Light wt., 25 lbs. to roll.....\$0.40  
 Medium wt., 30 lbs. to roll.....\$0.47  
 Heavy wt., 40 lbs. to roll.....\$0.60  
 Medium Grades Water Proof  
 Sheathing.....\$0.65@1.25  
 Deafening Felt, 9, 6 and 4 1/2 sq. ft.  
 to lb., ton.....\$40.00@52.00  
 Red Rope Roofing, 250 sq. feet per  
 roll.....\$1.65

NOTE.—These goods are often sold at  
 delivered prices.  
**Tarred Paper.**  
 1 ply (roll 300 sq. ft.), ton.....\$29.00@32.00  
 2 ply, roll 108 sq. ft.....55c@55c  
 3 ply, roll 108 sq. ft.....77c@87c  
 Slater's Felt (roll 500 sq. ft.).....70c  
 NOTE.—above prices often include deliv-  
 ery.  
**K. K. M. Stone Surfaced Roofing (roll**  
 110 sq. ft.).....\$2.75  
**Sand and Emery—**  
 List Dec. 25, 1899.....60c@80c@10%  
**Parers—Apple—**  
 Advance.....per doz. \$4.50  
 Baldwin.....per doz. \$5.00  
 Bonanza.....each \$5.00  
 Dandy.....each \$7.50  
 Eureka, 1898.....each \$16.00  
 Family Bay State.....per doz. \$12.00  
 Hudson's Little Star.....per doz. \$4.00  
 Hudson's Locking Table.....per doz. \$5.50  
 Improved Bay State.....per doz. \$27.00@30.00  
 New Lightning.....per doz. \$5.50  
 Reading 72.....per doz. \$4.00  
 Reading 78.....per doz. \$7.00  
 Turn Table '98.....per doz. \$5.50  
 White Mountain.....per doz. \$4.00  
**Potato—**  
 Saratoga.....per doz. \$5.50  
 White Mountain.....per doz. \$4.50  
**Paris Green—**  
 Arsenic kegs or casks.....1 1/2@12 1/2c  
 Kegs, 100 to 175 lbs.....12 @13c  
 Kits, 14, 28, 56 lbs.....13 @14c  
 Paper boxes, 2 to 5 lbs.....13 @14c  
 Paper boxes, 1 lb.....13 @14c  
 Paper boxes, 1/2 lb.....14 @15c  
 Paper boxes, 1/4 lb.....15 @16c  
**Picks and Mattocks—**  
 List Feb. 23, 1899.....70c@70c@10%  
**Pigeons—Clay**  
 Markle's Black Birds, f.o.b. factory,  
 per al.....\$3.75  
 See also Trap, Target.  
**Pinking Irons—**  
 See Irons, Pinking.  
**Pins—Escutcheon—**  
 Brass.....60c@60c@10%  
 Iron, list Nov. 11, '85.....60c@60c@10%  
**Pipe, Cast Iron Soil—**  
 Standard, 2-1/2 in.....60c@7 1/2c  
 Extra Heavy, 2-6 in.....70%  
 Fittings.....75c@5%  
**Pipe, Merchant, Boiler**  
 Tubes, &c. Black. Galva.  
 1/2 to 1 1/2 inch.....65% 65%  
 3/4 to 1 1/2 inch.....64% 64%  
 Boiler Tubes.....Up to  
 Steel.....22 feet  
 1 to 1 1/2 inch, inclusive.....47 1/2c  
 3/4 to 2 1/2 inch, inclusive.....65%  
 1 1/2 to 2 1/2 inch and 6 to 13 inches.....60%  
 Iron.  
 1 to 1 1/2 inch and 2 1/2 in.....43 1/2c  
 1 1/2 to 3 1/2 inch.....45%  
 2 1/2 to 13 inch.....53%  
 Casing, Cut Lengths. S. & S.  
 2 to 8 inch.....51 1/2c  
 3 1/2 to 4 inch.....57 1/2c  
 4 1/2 to 12 1/2 inch.....59 1/2c  
**Pipe Sewer—**  
 Standard Pipe and Fittings, 2 to 2 1/2 in.  
 New England.....70%  
 New York and New Jersey.....73%  
 Maryland, Delaware, East Penn. 75%  
 West Penn. and West Va.....75%  
 Virginia.....78%  
 Ohio, Michigan and Ky.....8 1/2%  
 Carload lots are generally delivered.  
**Planes and Plane Irons—**  
**Wood Planes—**  
 Molding.....50c@2 1/2@40c@10%  
 Bench, First quality 45c@1.00@1.10@10%  
 Bench, Second qual. 50c@1.00@1.10@10%  
 Bailey's (Stanley & L. Co.).....25c@1.00@1.10@10%  
 Gage Self Setting.....25c@1.00@1.10@10%  
**Iron Planes—**  
 Bailey's (Stanley & L. Co.).....25c@1.00@1.10@10%  
 Chaplin's Iron Planes.....50c@1.00@1.10@10%  
 Miscellaneous Planes (Stanley & L.  
 Co.).....25c@1.00@1.10@10%  
 Sargent's.....50c@1.00@1.10@10%  
**Plane Irons—**  
 Wood Bench Plane Irons.....30c@50c@1.00@10%  
 Buck Bros.....30%  
 Stanley & L. Co.....30c@1.00@1.10@10%  
 L. & J. White.....20c@25c@25%  
**Planters, Corn, Hand.**  
 Kohler's Eclipse.....per doz. \$9.00  
**Plates—**  
 Feloc.....lb. 3 1/2@4c  
 Self-Sealing Pie Plates (S. S. & Co.),  
 doz. \$3.00.....50%  
**Pliers and Nippers—**  
 Button Pliers.....75c@75c@10%  
 Gas Burner, per doz., 5 in., \$1.15@  
 \$1.20; 6 in., \$1.35@1.45  
 Gas Pipe.....7 8 10 12-in.  
 \$1.75 \$2.00 \$2.75 \$3.75  
**Aeme Nippers.....**  
 Bernard's.....95%  
 Paragon Pliers.....95%  
 Lord Pliers.....50%  
 Elm City Fence Pliers.....35%  
 Cronk Hanger Co.:  
 American Button.....75c@1.00  
 Cronk's.....60%  
 Improved Button.....70c@1.00  
 Stub's Pattern.....50%  
 Combination and others.....25%  
 Heller's Farriers' Nippers, Pincers,  
 and Tools 50c@50c@5%  
 P., S. & W. Timmers' Cutting Nippers,  
 ting Pliers.....30c@30c@10%  
 Utica Drop Forge & Tool Co.,  
 Pliers and Nippers, all kinds.....40%  
**Plumbs and Levels—**  
 Plumbs and Levels.....75c@75c@10%  
 Davis Iron, Machinist Nos. 1 to 14.....30%  
 Davis Iron, Adjustable Nos. 6 to 49.....35%  
 Dickson's.....70%  
 Pocket Levels.....75c@1.00@1.10@10%

Stanley & L. Co.....10c@10c@10%  
 Stanley's Duplex.....20c@20c@10%  
 Woods' Extension.....33%  
**Poachers, Egg—**  
 Buffalo Steam Egg Poachers, per doz.,  
 No. 1, \$7.20; No. 2, \$11.00 No. 3,  
 \$11.00; No. 4, \$14.50.....50%  
**Points, Glaziers—**  
 Bulk and 1 lb. papers.....lb. 8c@...  
 1/2-lb. papers.....lb. 8 1/2c@...  
 1/4-lb. papers.....lb. 9c@...  
**Pokes, Animal—**  
 Ft. Madison Hawkeye.....per doz. \$3.25  
 Ft. Madison, Western.....per doz. \$3.75  
**Police Goods—**  
 Manufacturers' Lists.....25c@25c@5%  
 Tower's.....25%  
**Polish—Metal—**  
 Prestoline Liquid, No. 1 (1/4 pt.), per doz.  
 \$3.00; No. 2 (1 qt.), \$0.72.....40%  
 Prestoline Paste.....40c@10%  
 George William Hoffman:  
 U. S. Metal Polish Paste, 3 oz. boxes, per  
 doz. 50c; per gr. \$4.50; 1/2 lb. boxes, per  
 doz. \$1.25; 1 lb. boxes, per doz. \$2.25.  
 U. S. Liquid 8 oz. cans, per doz. \$1.25;  
 per gr. \$12.00.  
**Barkeepers' Friend Metal Polish, per doz.**  
 \$1.75; per gr. \$18.00.  
 Wynn's White Silk, 1/2 pt. cans, per  
 doz.....\$2.00  
**Stove—**  
 Black Eagle Benzine Pasto, 5 lb cans.....  
 10%  
 Black Eagle, Liquid, 1/2 pt. cans.....per  
 doz. 75c  
 Black Jack Paste, 1/2 lb. cans, per doz. \$9.00  
 Ladd's Black Beauty, gr. \$10.00.....50%  
 Joseph Dixon's, per gr. \$5.75.....10%  
 Joseph's Plumbago.....per gr. \$2.50  
 Gem, per gr. \$4.50.....10%  
 Japanese.....per gr. \$3.50  
 Jet Black.....per gr. \$3.50  
 Peerless Iron Enamel, 1/2 pt. cans.....per  
 doz. \$1.50  
 Wynn's:  
 Black Silk, 5 lb. pail.....each 70c  
 Black Silk, 1/2 lb. box.....per doz. \$1.00  
 Black Silk, 5 oz. box.....per doz. \$0.75  
 Black Silk, 1/2 pt. liq.....per doz. \$1.00  
**Poppers, Corn—**  
 Round or Square:  
 1 qt.....gro. \$7.00@7.50  
 1 1/2 qt.....gro. 9.50@10.00  
 2 qt.....gro. 10.50@11.00  
**Post Hole and Tree Au-  
 ers and Diggers—**  
 See also Diggers, Post Hole, &c.  
**Potato Parers—**  
 See Parers, Potato.  
**Pots—Glue—**  
 Enamelled.....45%  
 Tinned.....40%  
**Powder—**  
 In Canisters:  
 Duck, 1 lb. each.....45c  
 Fine Sporting, 1 lb. each.....75c  
 Rifle, 1/2 lb. each.....15c  
 Rifle, 1-lb. each.....25c  
 In Kegs:  
 Duck, 6 1/2-lb. kegs.....\$2.25  
 Duck, 12 1/2-lb. kegs.....\$4.25  
 Duck, 25-lb. kegs.....\$5.00  
 Rifle, 6 1/2-lb. kegs.....\$1.25  
 Rifle, 12 1/2-lb. kegs.....\$2.25  
 Rifle, 25-lb. kegs.....\$4.00  
**King's Semi-Smokeless:**  
 Keg (25 lb. bulk).....\$6.50  
 Half Keg (12 1/2 lb. bulk).....\$3.50  
 Quarter Keg (6 1/2 lb. bulk).....\$1.90  
 Case 34 (1 lb. cans bulk).....\$8.50  
 Half case (1 lb. cans bulk).....\$4.50  
 King's Smokeless: Shot Gun Rifle  
 Keg (25 lb. bulk).....\$12.00 \$15.00  
 Half Keg (12 1/2 lb. bulk).....6.25 7.75  
 Quarter Keg (6 1/2 lb. bulk).....3.25 4.00  
 Case 24 (1 lb. cans bulk).....14.00 17.00  
 Half case 12 (1 lb. cans bulk).....7.25 8.75  
**Presses—**  
 Fruit and Jelly.....80c@25%  
**Seal Presses—**  
 Morrill's No. 1, per doz. \$20.00.....50%  
 Morrill's No. 2, per doz. \$22.50.....50%  
**Pruning Hooks and  
 Shears—See Shears.**  
**Pullers, Nail—**  
 Cyclops.....40c@40c@10%  
 Miller's Falls, No. 3, per doz. \$12.00.....15%  
 Pearson No. 1, Cyclone Spike Puller,  
 each \$50.00.....50%  
 Pelican, per doz. \$9.00.....40c@10%  
 Samsom.....per doz. \$18.00  
 Seranton Case.....  
 No. 1 (large), per doz. \$6.50; No. 2 (large),  
 \$7.50; No. 3 (small), \$5.00; No. 2-B (large),  
 \$5.50; No. 3-B (small), \$5.00; No. 2-D  
 (large), \$4.50; No. 3-D (small) \$4.00.  
 Smith & Hemenway Co.:  
 Diamond B, No. 2, ca. e lots, per doz \$5.50  
 Giant No. 1, per doz. \$18; No. 2, \$16.50;  
 No. 3, \$15.....40%  
**Pulleys—Single Wheel—**  
 Inch.....2 2 1/2 3  
 Aving, doz. \$0.45 .70 .95  
 Inch.....2 2 1/4 2 1/2  
 Hay Fork, Swivel or Solid Eye.....  
 doz. \$1.35@1.50  
 Hot House, doz. \$0.65 .90 1.20  
 Inch.....1 1/4 1 1/2 1 3/4  
 Screw, doz. \$0.15 .26 .35 .50  
 Inch.....1 1/4 1 1/2 1 3/4  
 Side, doz. \$0.30 .50 .65 .80  
 Inch.....1 1/4 1 1/2 1 3/4  
 Tackle, doz. \$0.30 .45 .65 1.10  
 Stowell's:  
 Ceiling or End, Anti-Friction.....60%  
 Dumb Waiter, Anti-Friction, 60c@10%  
 Hay Fork, Anti-Friction, 5-lb. Wheel,  
 per doz. \$12.00.....50%  
 Electric Light.....60%  
 Side, Anti-Friction.....60c@10%  
**Sash Pulleys—**  
 Common Frame: Square or Round  
 End per doz. 1 1/4 in., 1 1/2; 2 in., 1 1/2  
 Auger Mortise, no Face Plate, per  
 doz. 1 1/4 in., 1 1/2; 2 in., 1 1/2.  
 Auger Mortise, with Face Plate, per  
 doz. 1 1/4 in., 1 1/2; 2 in., 1 1/2.



Acme, 1 1/2 in., 16; 2 in., 19  
Common Sense, 1 1/2 in., 18; 2 in., 20  
Fox-All-Steel, Nos. 3 and 7 1/2 in., 25  
No. 9, 1 1/2 in., 20  
Extra for Plated Finish, 20  
Extra for Anti-Friction Bronze Bushing, 10  
Grand Rapids All-Steel Noiseless, 40  
Ideal No. 13, 1 1/2 in., 16; 2 in., 18  
Niagara, 1 1/2 in., 14; 2 in., 16  
No. 20, Troy, 1 1/2 in., 14; 2 in., 16  
Star, 1 1/2 in., 10; 2 in., 12  
Tackle Block—See Blocks

**Pumps—**  
Cistern, 60 to 100 ft. 10%  
Pitcher Spout, 75 to 100 ft. 10%  
Wood, 50 to 100 ft. 10%  
Pump Leathers, Lower and Plunger Valves—Per Gro.:  
Inch. 2 2 1/2 3 1/2 4 1/2 5 1/2  
\$1.30 3.60 5.85 6.10 4.40  
Barnes Dbl. Acting (low list), 50%  
Flint & Walling's Fast Mail (low list), 75%  
Myer's Pumps, low list, 20%  
Myer's Power Pumps, 50%  
Myer's Spray Pumps, 50 to 10%  
Contractors' Rubber Diaphragm Non-chokable, P. & L. Block Co., 30%

**Punches—**  
Revolving (4 tubes), doz., \$3.75 to \$4.25  
Saddlers' or Drive, good, doz., 65 to 70¢  
Spring, single tube, good quality, 1.15 to 1.75  
Bemis & Call Co.'s Cast Steel Drive, 50%  
Bemis & Call Co.'s Chisel, 50%  
Bemis & Call Co.'s Spring, 50%  
Morrill's No. 1 (A. B. C.), doz., \$15.00, 30%  
No. 2, 1/2 in., \$22.50, 30%  
No. 2, Metal, doz., \$45.00, 30%  
Bench Punch, each, \$4.00, 30%  
Niagara Hollow Punches, 50%  
Niagara Solid Punches, 50%  
Steel Screw, B. & K. Mfg. Co., 40%  
Tinnery's Hollow, P. & S. W. Co., 35 to 38%  
Tinnery's Solid, P. & S. W. Co., doz., \$1.44, 60%

**Rail—Barn Door, &c.—**  
Cast Iron, Barn Door, Flange Screw Holes for Rd. Groove Wheels:  
1 1/2 in., \$1.70  
2 in., \$2.10  
3 in., \$2.50  
Angular for Sq. Groove Wheels:  
Small, Med. Large,  
1.50 1.75 2.70 100 feet.

Sliding Door, Braced Wrt. Iron, 6 1/2 in., 30%  
Sliding Door, Iron Painted, 2 1/2 in., 30%  
Sliding Door, Wrought Brass, 1 1/2 in., 30%  
Cronk's Double Braced Steel Rail, 3 1/2 in., 30%  
Cronk's O. N. T. Rail, 3 1/2 in., 30%  
Lanes' O. N. T., 100 ft., 1 inch., \$2.50  
Lanes' Standard, 100 ft., 3 1/2 in., 30%  
Lawrence Bros., 30%  
McKinney's None Better, 30%  
McKinney's Standard, 30%  
Stowell's Cast Rail, 30%  
Stowell's Steel Rail, Plain, 30%  
Stowell's Wrought Bracket, Plain, 30%

**Rakes—**  
Net Prices, Malleable Rakes:  
Shank, 10 13 14 16-tooth  
\$1.50 1.60 1.75 1.85  
Socet, 1.65 1.90 1.95 2.10  
Sept. 1, 1900, List:  
Cast Steel, 70 to 85¢  
Malleable, 70 to 100¢  
Lawn Rakes, Metal Head, per doz., 20 teeth, \$3.25 to \$3.50  
24 teeth, \$3.50 to \$3.75  
Fort Madison Red Head Lawn, \$3.25  
Fort Madison Blue Head Lawn, \$3.00  
Jackson Lawn, 20 and 30 teeth, 40¢  
Kohler's:  
Lawn Queen, 20-tooth, doz., \$3.00  
Lawn Queen, 24-tooth, doz., \$3.75  
Paragon, 30-tooth, doz., \$2.85  
Paragon, 24-tooth, doz., \$3.00  
Steel Garden, 14-tooth, doz., \$3.00  
Malleable Garden, 14-tooth, doz., \$2.25

**Rasps, Horse—**  
Denton's, 75%  
Heller Bros., 75%  
McCaffrey File Co. Horse Rasps, 60 to 10%  
New Nicholson Horse Rasp, 70 to 10%  
See also Files.

**Razors—**  
Boracic, 70%  
Fox Razors, No. 42, doz., \$20.00, 40%  
Fox Razors, No. 44, doz., \$24.00, 40%  
Fox Razors, No. 82, Platina, \$24.00

Silberstein:  
Carbo Magnetic, \$18.00  
Griffon, No. 65, \$15.00  
Griffon, No. 69, \$12.00  
All other Razors, 40%  
Safety Razors, 40%

**Razor Straps—**  
See Straps, Razor.

**Reels—Fishing—**  
Hendryx Aluminum, German Silver, Gold, Bronze, Silver, Rubber, Poplar and Salmon, Single Action, Multiplying and Quadruple, all sizes, 25%  
Hendryx Single Action Series, 109P and PN, 202P and PN, 102P and PN, 202P and PN, 304P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor, 50%  
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 3004N, 3004P and PN, 00200P and PN, 0024 and 0024N, 5009N and PN, 40 to 10%  
Shakespeare Style C, 25%

**Registers—**  
List Sept. 3, 1901.  
Black Jap., 75 to 100¢  
White Jap., 75 to 100¢  
Bronzed, 75 to 100¢  
Nickel Plated, 75 to 100¢  
Electro Plated, 75 to 100¢  
There is a good deal of irregularity in prices of Registers.  
**Revolvers—**  
Single Action, 40 to 90¢

Double Action, except 44 calibers, \$1.50  
Doubt Ac 44 calibers, \$1.65  
Automatic, \$3.10  
Hammerless, \$3.00

**Riddles, Grain or Sand—**  
10 in. per doz., \$2.00 to \$2.25  
17 in. per doz., \$2.25 to \$2.50  
18 in. per doz., \$2.50 to \$2.75

**Rings and Ringers—**  
Bull Rings—  
Steel, 3 1/2 3 inch.  
\$0.80 0.90 0.95  
Copper, 1.10 1.25 1.50 doz.

**Hog Rings and Ringers—**  
Hill's Rings, gro. boxes, \$4.00 to \$4.50  
Hill's Ringers, Gray Iron, doz., 55 to 60¢  
Hill's Ringers, Mal. Iron, doz., 75 to 80¢  
Hill's Rings, per gro., \$5.00 to \$5.25  
Blair's Ringers, per doz., \$6.00 to \$6.25  
Brown's Rings, per gro., \$6.00 to \$6.25  
Brunn's Ringers, per doz., \$1.00 to \$1.10  
Rapid Rings, per gro., \$6.00  
Rapid Ringers, per doz., \$3.50

**Rivets and Burrs—**  
Copper, 50¢ to 10¢ to 50¢ to 10¢  
Iron or Steel:  
Tinnery's, 70 to 70¢ to 10%  
Miscellaneous, 70 to 70¢ to 10%

**Rivet Sets—See Sets**  
**Roasting and Baking Pans—See Pans, Roasting and Baking.**

**Rollers—**  
Acme, Stowell's Anti-Friction, 50%  
Barn Door, Sargent's list, 50 to 100¢  
Cronk's Stay, 60 to 65¢  
Cronk's Brinkerhoff, 60 to 65¢  
Lane's Stay, 33 to 34¢  
Stowell's Barn Door Stay, per doz., \$1.25

**Rope—**  
Manila, 7-16 in. and larger, tarred or untarred, lb., 13 1/2¢  
Manila, 3/4 in. and larger, lb., 14¢  
Manila 1/4 and 5-16 in., lb., 14 1/2¢  
Manila Hay, Hide and Bale Rope, Medium and Coarse, lb., 13 1/2¢  
Sisal, 7-16 in. and larger, lb., 10¢  
Sisal, 3/4 in. and larger, lb., 10 1/2¢  
Sisal, 1/4 and 5-16 in., lb., 11¢  
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse, lb., 10 1/2¢  
Sisal, Tarred, Medium and Coarse, lb., 9 1/2¢  
Cotton Rope:  
Best, 1/4 in. and larger lb., 13 1/2¢  
Medium, 1/4 in. and larger lb., 11¢  
Com., 1/4 in. and larger lb., 9¢  
Jute Rope:  
Thread No. 1, 1/4 in. and up lb., 6 1/2¢  
Thread No. 2, 1/4 in. and up lb., 6¢  
Yarn, 1/4 in. and up, lb., 6¢

**Wire Rope—**  
Galvanized, 25 to 75¢  
Plain, 30 to 75¢  
**Ropes, Hammock—**  
Covert Mfg. Co., 45 to 50¢  
Covert Saffery Works, 40 to 45¢

**Rules—**  
Hoxwood, 60 to 80¢ to 10%  
Ivory, 35 to 100¢ to 35 to 100¢  
Chapin-Stephens Co., 60 to 80¢ to 10%  
Boxwood, 35 to 100¢ to 35 to 100¢  
Larkin's Steel, 35 to 100¢ to 35 to 100¢  
Larkin's Lumber, 50 to 100¢  
Stanley R. & L. Co., 60 to 80¢ to 10%  
Boxwood, 60 to 80¢ to 10%  
Ivory, 35 to 100¢ to 35 to 100¢  
Upson Nut Co., 60 to 80¢ to 10%  
Boxwood, 35 to 100¢ to 35 to 100¢  
Ivory, 35 to 100¢ to 35 to 100%

**Sad Irons—See Irons, Sad.**  
**Sand and Emery Paper and Cloth—**  
See Paper and Cloth.

**Sash Cords—See Cord, Sash.**  
**Sash Locks—See Locks, Sash.**  
**Sash Weights—**  
See Weights, Sash.

**Sausage Stuffers or Fillers—**  
See Stuffers or Fillers Sausage.

**Saw Frames—See Frames, Saw.**  
**Saw Sets—See Sets, Saw.**  
**Saw Tools—See Tools, Saw.**

**Saws—**  
Circular, 50 to 50¢ to 10%  
Band, 50 to 50¢ to 10%  
Cross Cut, 50 to 50¢ to 10%  
Mulay, Mill and Drag, 50 to 10%  
One-Man Saw, 40%  
Wood Saws, 40%  
Hand, Compass, &c., 40%  
Diamond Saw and Stamping Works, 25%  
Sterling Kitchen Saws, 25%

**Diston's:**  
Circular Solid and Inserted Tooth, 50%  
Band 2 to 14 in. wide, 60%  
Band 1/4 to 1 1/2, 70%  
Crosscuts, 45 to 45¢ to 10%  
Narrow Crosscuts, 50 to 50¢ to 10%  
Mulay, Mill and Drag, 50%  
Pruned Woodsaws, 50%  
Woodsaw Blades, 40 to 40¢ to 75%  
Woodsaw Rods, 25%  
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 70, 77, 8, 25 to 25¢ to 75%  
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 0, 00, Combination, 30 to 30¢ to 75%  
Compass, Keyhole, &c., 25 to 25¢ to 75%  
Butch & Saws and Blades, 35 to 35¢ to 75%  
C. E. Jennings & Co.'s:  
Hack Saws, 25%  
Butcher Saws, 25%  
Compass and Key Hole Saws, 25%  
Frame and Wood Saws, 40%  
Hand Saws, 25 to 30%  
Wood Saw Blades, 45 to 45%  
Peace:  
Circular and Mill, 60%  
Crosscuts, list Jan. 1, '99, 50%  
Hand, Panel and Rip, 30%  
Barnard:  
Circular and Mill, 60%  
Hand, &c., 30%  
X Cuts, list Jan. 1, '99, 60%

**Stonemasons:**  
Circular Saws, 50%  
Crescent Ground Cross Cut Saws, 35%  
One-Man Cross Cuts, 40 to 10%  
Gang Mill, Mulay and Drag Saws, 50%  
Hack Saws, 25 to 25¢ to 75%  
Hand Saws, 25 to 25¢ to 75%  
Hand Saws, 25 to 25¢ to 75%  
Compass, Keyhole, &c., 25 to 25¢ to 75%  
Wood Saws, 35 to 35¢ to 75%

**Hack Saws—**  
Diston:  
Concave Blades, 25%  
Keystone, 30%  
Hack Saw Frames, 30%  
C. E. Jennings & Co.'s:  
Hack Saw Frames, Nos. 175, 180, 330, 40%  
Hack Saws, Nos. 175, 180, 330, complete, 40%  
Griffin's Hack Saw Frames, 45%  
Griffin's Hack Saw Blades, 45%  
Star Hack Saws and Blades, 15 to 15%  
Sterling Hack Saw Blades, 25%  
Sterling Hack Saw Frames, 20%

**Scroll—**  
Barnes' No. 7, \$15, 25%  
Barnes' Scroll Saw Blades, 40%  
Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18, 20%  
with boring attachment, \$20, 20%  
Lester, complete, \$10.00, 15 to 15%  
Rogers, complete, \$4.00, 15 to 15%

**Scale Beams—**  
See Beams, Scale.

**Scales—**  
Family, Turnbull's, 30 to 30¢ to 10%  
Counter:  
Hatch, Platform, 1/2 oz to 10 lbs, doz., \$5.50  
Two Platforms, 1/2 oz to 8 lbs, doz., \$16  
Union Platform, Plain, \$1.70 to \$1.90  
Union Platform, Striped, \$1.85 to \$2.15  
Chatillon's:  
Eureka, 25%  
Favorite, 40%  
Grocery Trip Scales, 50%  
Pelouse Scales—Horseshold, Counter, Confectionery, Postal, Ice, &c., 50%  
"The Standard" Portables, 45%  
"The Standard" R. R. and Wagon, 60%

**Scrapers—**  
Box, 1 Handle, doz., \$2.25 to \$2.50  
Box, 2 Handle, doz., \$3.75 to \$4.00  
Ship, No. 1, doz., \$3.50; No. 2, \$2.25 to \$2.40  
Adjustable Box Scraper (S. R. & L. Co.), \$4.00, 30 to 30¢ to 10%

**Screens, Window, and Frames—**  
Bonanza Window Screens, 60 to 60¢ to 5%  
Flyer Pattern Window Screen, 60 to 60¢ to 5%  
Maine Window Screen Frames, 40 to 40¢ to 5%  
Perfect Window Screens, 60 to 60¢ to 5%  
Phillips' Window Screen Frames, 60 to 60¢ to 5%  
Porter's Hummer Window Screens, 60 to 60¢ to 5%  
Porter's Klondike Window Screens, 60 to 60¢ to 5%  
Wabash Spring Adj. Screen, 50%  
See also Doors.

**Screw Drivers—**  
See Drivers, Screw.

**Screws—Bench and Hand—**  
Bench, Iron, doz., 1 in., \$3.00 to \$3.25; 1 1/4, \$3.50 to \$3.75; 1 1/2, \$4.00 to \$4.50  
Bench, Wood, Beech, doz., \$3.50 to \$3.75  
Hand, Wood, 30 to 30¢ to 40%  
Hand, R. Bliss Mfg. Co., 35%  
Coach, Lag and Hand Rail—  
Lag, Common Point, list Oct. 1, 1901, 75 to 75¢ to 5%  
Coach and Lag, Gimlet Point, list Oct. 1, '99, 75 to 75¢ to 5%  
Hand Rail, list Jan. 1, '81, 60 to 60¢ to 10%  
Jack Screws—  
Standard List, 75 to 75¢ to 10%  
Millers Falls, 50 to 50¢ to 10%  
Millers Falls, Roller, 50 to 50¢ to 10%  
P. S. & W., 50 to 50¢ to 75%  
Sargent, 70 to 70¢ to 10%

**Machine—**  
List Jan. 1, '98.  
Flat or Round Head, Iron, 50 to 50¢ to 10%  
Flat or Round Head, Brass, 50 to 50¢ to 10%  
Set and Cap—  
Set (Iron or Steel), 70%  
Sq. Hd. Cap, 65%  
Hex. Hd. Cap, 65%  
Rd. or Filler Hd. Cap, 60%

**Wood—**  
List Jan. 1, 1900.  
Manufacturers' printed discounts:  
Flat Head, Iron, 87 1/2 to 90%  
Round Head, Iron, 85 to 87 1/2%  
Flat Head, Brass, 85 to 87 1/2%  
Round Head, Brass, 82 1/2 to 85%  
Flat Head, Bronze, 75 to 80%  
Round Head, Bronze, 72 1/2 to 77 1/2%  
Drive Screws, 87 1/2 to 90%  
NOTE—Extra 10 to 10% often given.

**Scroll Saws—See Saws, Scroll.**

**Scythes—**  
Clipper Pattern, Grass, per doz., \$4.25  
Full Polished Clipper, \$4.75  
Grain, \$7.00  
Upper Grain, \$7.50  
Wood and Bush, \$4.50

**Scythe Snaths—**  
See Snaths, Scythe.

**Seeders—Raisin—**  
Enterprise, 25 to 30%

**Sets—Awl and Tool—**  
Brad Awl and Tool Sets:  
Wood Hdl., 10 Awls, doz., \$1.00 to \$1.25  
Wood Hdl., 14 Awls, 6 Tools, doz., \$3.50 to \$2.60  
Allen's Sets, Awl and Tools:  
No. 3, doz., \$1.00, 50 to 100¢ to 10%  
Frax's Adj. Tool Hdl., Nos. 1, 112, 2, \$1.8; 3, 112, 4, \$2; 5, \$7, 30%  
Millers Falls Adj. Tool Hdl., No. 1, \$12; No. 4, \$12; No. 5, \$18, 15 to 15%  
Stanley's Excelsior:  
No. 1, \$7.50; No. 2, \$4.00 to \$4.10 to 10%  
No. 3, \$5.50, 10 to 10%  
**Garden Tool Sets—**  
Ft. Madison Rakes, Shovel and Hoe, per doz., \$9.00

**Nail—**  
Square, per gro., \$2.50  
Round, Blk. and Poi., assorted, gro., \$1.80 to \$2.50  
Octagon, per gro., \$1.25 to \$1.75  
Knurled, Good, per gro., \$1.00 to \$1.50  
Buck Brothers, 27 1/2%  
Cannon's Diamond Point, per gr., \$12, 25%  
Mayhew's, per gro., \$9.00  
Snell's Corrugated, Cup Pt., per gro., \$7.50  
Snell's Knurled, Cup Pt., per gro., \$7.50

**Rivet—**  
Regular list, 70 to 70¢ to 10 to 5%

**Saw—**  
Allen's:  
Genuine, per doz., \$5.50 to \$6.00  
Imitation, per doz., \$3.00 to \$3.10  
Atkin's:  
Criterion, 40%  
Adjustable, 40%  
Bemis & Call Co.'s:  
Cross Cut, 30%  
Hammer, new Pat., 45%  
Plate, 30%  
Spring Hammer, 30%  
Diston's Star and Monarch, 25%  
Morrill's No. 1, \$15.00, 50%  
Nos. 3 and 4, Cross Cut, \$20.00, 50%  
No. 5, Mill, \$30.00, 50%  
Nos. 10, 11, 95, \$15.00, 50%  
No. 1 Old Style, \$10.00, 50%  
Taintor Positive, per doz., \$18, 60%

**Sharpeners, Knife—**  
Chicago Wheel & Mfg. Co., 65%  
Smith & Menenway Co., 70 to 75%  
Tantite Mills, per gross, \$14.40, 35 to 35% to 45%

**Sharpeners, Skate—**  
Eureka Skate Sharpener, per doz., \$3.00

**Shaves, Spoke—**  
Iron, per doz., \$1.00 to \$1.25  
Wood, per doz., \$1.75 to \$2.00  
Bailey's (Stanley R. & L. Co.), 50 to 50¢ to 10 to 10%  
Goodell's, per doz., \$9.00, 15 to 15%

**Shears—**  
Cast Iron, 7 8 9 in.  
Best, \$16.00 18.00 20.00 gro.  
Good, \$13.00 15.00 17.00 gro.  
Cheap, \$7.00 8.00 7.00 gro.  
Straight Trimmers, &c.:  
Best quality, Jap., 70 to 70¢ to 10%  
Nickel, 60 to 60¢ to 10%  
Fair qual. Jap., 80 to 80¢ to 5%  
Nickel, 75 to 75¢ to 10%  
Tailors' Shears, 400 to 400¢ to 10%  
Acme Cast Shears, 400 to 400¢ to 5%  
Helmich's Tailors' Shears, 40%  
Wilkinson's Hedge, 50%  
Wilkinson's Sheep, 1900 list, 50%

**Tinners' Snips—**  
Steel Blades, 20 to 20¢ to 10%  
Steel Laid Blades, 40 to 40¢ to 10%  
Forged Handles, Steel Blades, Berlin, 40 to 40¢ to 10%  
Jennings & Griffin Mfg. Co.'s, 7 to 10 inch, 50%  
Niagara Snips, 40 to 40¢ to 10%  
P. S. & W. Co., 40 to 40¢ to 10%

**Pruning Shears and Tools—**  
Cronk's Grape Shears, 30 to 30¢ to 5%  
Cronk's Pruning Shears, 30 to 30¢ to 5%  
Diston's Combined Pruning Hook and Saw, per doz., \$18.00, 35 to 35% to 10%  
Diston's Pruning Hook, per doz., \$12.00, 25 to 25% to 10%  
John T. Henry Mfg. Company:  
Pruning Shears, all grades, 40 to 40¢ to 5%  
Orange Shears, 50 to 50¢ to 5% to 20%  
Grape, 40 to 40¢ to 5%  
Tree Pruner, 75%  
Nagley's Pruning Shears, 10 to 10%  
P. S. & W. Co., 30 to 30% to 5%

**Sheaves—Sliding Door—**  
Stowell's Anti-Friction, 50%  
Patent Roller Hatfield's, Sargent's list, 75 to 75¢ to 10%  
Reading, 70 to 70¢ to 75%  
R. & E. list, 70 to 70¢ to 75%  
Wrightsville, Hatfield Pattern, 30 to 30%  
**Sliding Shutter—**  
Reading list, 70 to 70¢ to 75%  
R. & E. list, 30 to 30% to 10%  
Sargent's list, 50 to 50¢ to 10%

**Shells—Shells, Empty—**  
Brass Shells, Empty:  
First quality, all gauges, 40 to 40%  
Climax, Club, Rival, 10 and 12 gauge, 65 to 65%

**Paper Shells, Empty:**  
Acme, Ideal, Lander, New Rapid, Mangle, 10, 12, 16 and 20 gauge, 35 to 35%  
Bliss Rival, New Climax, Challenge, Monarch, Defence, New Victor, Repeat, Yellow Rival, 10, 12, 13 and 20 gauge, 20%  
Climax, Union, League, New Rival, 10 and 12 gauge, 25%  
Climax, Union, League, New Rival, 14, 16 and 20 gauge (\$7.50 list), 20%  
Expert Metal Lined and Pigeon 10, 12, 16 and 20 gauge, 33 1/2 to 33 1/2%

**Shells, Loaded—**  
Loaded with Black Powder, 40 to 40%  
Loaded with Smokeless Powder, medium grade, 40 to 40%  
Loaded with Smokeless Powder, high grade, 40 to 40% to 40%  
**Shoes, Horse, Mule, &c.—**  
F. O. b., Pittsburg.

Iron, per keg, \$3.00  
Steel, per keg, 3.35  
Burdett's, all sizes, per keg, \$3.00

**Shot—**  
Drop, up to B, 25-lb. bag, \$1.35  
Drop, B and larger, per 25-lb. bag, \$1.60  
Buck, 25-lb. bag, \$1.60  
Chilled, 25-lb. bag, \$1.60  
Fast Shot, 25-lb. bag, \$1.60  
Markle's Chilled, \$1.60  
Raymond's Chilled, \$1.60

**Shovels and Spades—**  
Association list, March, 1902, 40%  
**Sieves and Sifters—**  
Hawley's Imitation, per \$11.00 to \$11.50  
Buffalo Metallic Sifted, S. & S. Co., per gr.:  
14 and 16, 10 to 10%  
12 and 14, \$15.00

F. J. Meyers' Mfg. Co.:  
 Elipsoidal Light..... gr. \$11.00  
 Hunter's Genuine..... gr. \$12.50  
 No Name, Hunter's..... gr. \$11.00  
 Standard..... gr. \$11.00  
 Shaker (Barler's Pat.) Flour Sifters..... \$2.00

**Sieves, Tin Rim—**  
 Mesh..... 16 18 20  
 Black, full size..... \$0.95 .98 1.00 1.10  
 Plated, full size..... \$1.05 1.03 1.10 1.20  
 Black, scant..... \$0.78 .80 .83

**Sieves, Wooden Rim—**  
 Nested, 10, 11 and 12 Inch.....  
 Mesh 18, Nested, doz..... \$0.65 @ 0.75  
 Mesh 20, Nested, doz..... .75 @ .85  
 Mesh 24, Nested, doz..... .90 @ 1.00

**Sinks—Cast Iron—**  
 Standard list..... \$5.50 @ 7.00  
 NOTE.—There is not entire uniformity  
 lists used by jobbers.

**Wrought Steel—**  
 New Era, Galv'd and Enamelled..... 70 & 5  
 New Era, Painted..... 50 & 10  
 L. & G. Mfg. Co., Galvanized..... 50  
 L. & G. Mfg. Co., Enamelled..... 50

**Sinks, Wagon—**  
 Cast Iron..... 70 & 10 @ 75  
 Malleable Iron..... 100 @ 10 @ 50  
 Steel..... 100 @ 10 @ 105

**Slates—**  
 Factory Shipments.....  
 "D" Slates..... 50 & 10 @ 10 & 105  
 Unexcelled, etc., Noiseless Slates, 60  
 & 8 tens..... 50 & 10 @ 55

**Wire Bound.....**  
 Web Hinge..... 50 & 10 @ 55  
**Slaw Cutters—See Cutters.**  
**Slicers, Vegetable—**  
 Sterling \$2.00..... 33 & 1/2

**Sinks, Harness—**  
 German..... 40 @ 40 & 10  
 Covert Mfg. Co.:  
 Derby..... 35 & 2  
 High Grade..... 45 & 2  
 Jockey..... 40 & 2  
 Trojan..... 45 & 2  
 Yankee..... 35 & 2  
 Yankee, Roller..... 30 & 2

**Covert's Saddlery Works:**  
 Crown..... 60  
 German..... 60  
 Model..... 60  
 Triumph..... 60  
 W. & E. T. Fitch Co.:  
 Bristol..... 40 & 10  
 Empire..... 50 & 5  
 German..... 50 & 5  
 National..... 50 & 5  
 Perfect..... 45  
 Clipper..... 50 & 5  
 Champion..... 40  
 Security..... 40  
 Victor..... 60 & 5

**Onella Community:**  
 Solid Steel..... 55 & 10 @ 55 & 10  
 Solid Steel..... 55 & 10 @ 55 & 10  
 Sargent's Patent Guarded..... 60 & 10  
**Snaths—**  
 Scythe..... 50 @ 50 & 10

**Snips, Tinnners—See Shears**  
**Soldering Irons—**  
 See Irons, Soldering.  
**Spoke Trimmers—**  
 See Trimmers, Spoke.  
**Spoons and Forks—**  
 Silver Plated—

**Good Quality.....**  
 Cheap.....  
 International Silver Co.:  
 1847 Rogers Bros. and Rogers & Hamil-  
 ton..... 40 & 10  
 Rogers & Bro., William Rogers Eagle  
 Brand..... 50 & 10  
 Anchor, Rogers Brand..... 60  
 Wm. Rogers & Son..... 60 & 10  
 Simeon L. & Geo. H. Rogers Co.:  
 Silver Plated Flat Ware..... 60  
 No. 17 Silver Plated Ware..... 60 & 10

**Miscellaneous—**  
 German Silver..... 60 & 10 @ 60 & 10  
 Cartasagus Cutlery Co.:  
 Yukon Silver..... 60  
 Simeon L. & Geo. H. Rogers Co.:  
 German or Nickel Silver, Special Hat  
 1 & 10

**Tinned Iron—**  
 Teas..... per gro. 45 @ 50  
 Tables..... per gro. 90 @ 1.00  
**Springs—Door—**  
 Genl (Coll.)..... 20  
 Star (Coll.)..... 30  
 Torrey's Rod, 39 in..... \$1.10 @ 1.25  
 Victor (Coll.)..... 50 & 10 @ 10

**Carriage, Wagon, &c.**  
 14 in. and Wider:  
 Black or 1/2 Bright, lb..... 5 c  
 Bright, lb..... 5 1/2 c  
 Painted Seat Springs:  
 1 1/2 x 2 x 26 and smaller, per pr 48 @ 53 c  
 1 1/2 x 2 x 28 per pr..... 56 @ 61 c  
 1 1/2 x 3 x 28 and narrower, per pr..... 75 @ 80 c

**Cliff's Springs:**  
 Bolster..... 40  
 Seat..... per pair, 50  
 Pole, per pair, 1/2 in. \$1.10; 3/4 in. \$1.25

**Sprinklers, Lawn—**  
 Enterprise..... 25 @ 29  
 Philadelphia No. 1, \$ doz. \$12; No. 2,  
 \$15; No. 3, \$24  
**Squares—**  
 Nickel plated..... List Jan. 5, 1901  
 Steel and Iron..... 75 @ 75 & 10  
 Rosewood Hdl Try Square and T-  
 Bevels..... 60 & 10 @ 10 & 70  
 Iron Hdl. Try Squares and T-Bevels,  
 40 & 10 @ 10 & 10 & 105  
 Winterbottom's Try and Miter.....  
 40 & 10 @ 10 & 10 & 105

**Squeezers—Lemon—**  
 Wood, Common, gro., No. 1, \$5.25  
 @ \$5.50; No. 1, \$6.25 @ \$6.50.

**Wood, Porcelain Lined.**  
 Cheap..... doz. \$2.00 @ 2.75  
 Good Grade..... doz. \$3.00 @ 3.50  
 Tinned Iron..... doz. \$0.75 @ 1.25  
 Iron, Porcelain Lined doz. \$2.90 @ 3.25  
 Jennings' Star..... \$ doz. \$1.85 @ 1.90

**Staples—**  
 Barbed Blind..... lb. 6 @ 3/4 c  
 Electricians', Association list.....  
 80 & 10 @ 10 & 105  
 Fence Staples, same price as Barbed  
 Wire. See Trade Report.  
 Poultry Netting, Staples..... per lb.  
 3 1/4 @ 3/4 c

**Grand Crossing Tack Co.'s list.....**  
 80 & 10 @ 105

**Steels, Butchers—**  
 Dick's..... 305  
 Foster Bros..... 305  
 Hartzell Cutlery Co..... 40 & 5  
 C. & A. Hoffmann's..... 40

**Steelyards**  
**Stocks and Dies—**  
 Blacksmiths..... 40 @ 10 & 105  
 Gardner Die Stocks No. 1..... 505  
 Gardner Die Stocks, larger sizes..... 405  
 Green River..... 25  
 Lightning Screw Plate..... 25  
 Little Giant..... 25  
 Re-see's New Screw Plates..... 25 @ 305  
 Curtis Reversible Ratchet Die Stock..... 25

**Stone—**  
**Scythe Stones—**  
 Chicago Wheel & Mfg. Co.:  
 Gem Corundum, 10 inch, \$8.00 per  
 gro. 12 inch, \$10.00  
 Pike Mfg. Co. 1901 list:  
 Black Diamond S. S..... \$ gro. \$12.00  
 Lamolite S. S..... \$ gro. \$11.00  
 White Mountain S. S..... \$ gro. \$9.00  
 Green Mountain S. S..... \$ gro. \$8.00  
 Extra Indian Pond S. S..... \$ gro. \$7.50  
 No. 1 Indian Pond S. S..... \$ gro. \$7.00  
 No. 2 Indian Pond S. S..... \$ gro. \$6.50  
 Leader Red End S. S..... \$ gro. \$4.50  
 Balance of 1901 list 38 1/2

**Oil Stones, &c.**  
 Chicago Wheel & Mfg. Co., 1901 list:  
 Gem Corundum Oil, Double Grit..... 505  
 Gem Corundum Axe, Single or Double  
 Grit..... 355  
 Gem Corundum Slips..... 355  
 Gem Corundum Razor Hones..... 505  
 Pike Mfg. Co. 1901 list:  
 Arkansas Stone, No. 1, 3 to 5 in. \$2.50  
 Arkansas Stone, No. 1, 5 to 8 in. \$3.50  
 Arkansas Stone, No. 1, 8 to 11 in. \$4.50  
 Lily White Washita 4 to 8 in. \$6.00  
 Rosy Red Washita 4 to 8 in. \$6.00  
 Washita Stone, Extra, 4 to 8 in. \$5.00  
 Washita Stone, No. 1, 4 to 8 in. \$4.00  
 Washita Stone, No. 2, 4 to 8 in. \$3.00  
 Lily White Slips..... 905  
 Rosy Red Slips..... 905  
 Washita Slips, Extra..... 905  
 Washita Slips, No. 1..... 705  
 India Oil Stones (entire list)..... 255

**Hindustan No. 1, Regular.....**  
 83 & 1/2  
**Axe Stones (all kinds).....**  
 83 & 1/2  
**Turkey Oil Stones, ex. 5 to 8 in. \$1.00**  
 83 & 1/2  
**Queer Creek Stones, 4 to 8 in. \$1.00**  
 83 & 1/2  
**Queer Creek Slips.....**  
 83 & 1/2  
**Sand Stone, German and Swaty Razor  
 Hones.....**  
 405  
**Natural Grit Carving Knife Hones.....**  
 83 & 1/2  
**Quick Edge Pocket Knife Hones.....**  
 83 & 1/2  
**Mounted Kitchen Sand Stone.....**  
 83 & 1/2  
**Tanite Mill:**  
 Emery Oil, \$ doz. \$5.00..... 50 @ 60

**Stoners—Cherry—**  
 Enterprise..... 25 @ 305

**Stops, Bench—**  
 Millers Falls..... 15 & 10  
 Morrill's..... \$ doz. No. 1, \$10.00..... 505  
 Morrill's, No. 2, \$12.50..... 505

**Stops, Window—**  
 Ives' Patent..... 25 & 55

**Stove Boards—**  
 See Boards, Stove.  
**Stove Polish—See Polish, Stove.**  
**Strainers, Pump—**  
 Diamond Joe Pump Strainers..... per doz. 75

**Straps, Box—**  
 Carry's Universal, case lots..... 20 & 105

**Stretchers, Carpet—**  
 Cast Iron, Steel Points..... doz. 55 @ 65 c  
 Socket..... doz. \$1.75

**Strops, Razor—**  
 Smith & Hemenway Co..... 70

**Stuffers, Sausage—**  
 Enterprise Mfg. Co..... 25 @ 25 & 7 1/2  
 National Specialty Mfg. Co., list Jan.  
 1, 1901..... 305

**Sweepers, Carpet—**  
 National Sweeper Co.:  
 Marion, Roller Bearing, regular  
 finishes, full Nickel..... \$24.00  
 Marion Queen, Roller Bearing,  
 Fancy Veneers, full Nickel..... \$27.00  
 Monarch, Roller Bearing, Nickel..... \$22.00  
 Monarch, Roller Bearing, Jap'ed..... \$24.00  
 Marion Queen, Roller Bearing, full  
 Nickel..... \$27.00  
 Transparent, Roller Bearing, Plate  
 Glass Top, Nickel..... \$27.00  
 Monarch Extra, Roller Bearing,  
 (17-inch case), Nickel..... \$36.00  
 Monarch Extra, Roller Bearing (17-  
 inch case), Japanned..... \$33.00  
 Perpetual, Regular Bearings, Nkl..... \$30.00  
 Perpetual, Regular Bearings, Jan..... \$18.00  
 NOTE.—Discount of 30c per dozen on  
 three-dozen lots. Discount of \$1 per  
 dozen on five-dozen lots.

**Tacks Brads, &c.—**  
 List Jan. 15, '99.  
 Carpet Tacks, American 90 & 25 @.....  
 American Cut Tacks..... 90 & 25 @.....  
 Suedes Iron Tacks..... 90 & 25 @.....  
 Suedes Upholsterers' Tacks.....  
 90 & 25 @.....  
 Gimd Tacks..... 90 & 25 @.....

**Lace Tacks.....**  
 90 & 25 @.....  
**Trimmers' Tacks.....**  
 90 & 25 @.....  
**Looking Glass Tacks.....**  
 70 & 105  
**Bill Posters' and Railroad Tack.....**  
 90 & 25 @.....  
**Hungarian Nails.....**  
 80 & 155  
**Common and Patent Brads.....**  
 80 & 105  
**Trunk and Clout Nails.....**  
 80 & 55

**NOTE.—The above prices are for  
 straight weights. An extra 5% is given  
 Star Weights, and an extra 10% on  
 standard weights.**

**Miscellaneous—**  
 Double Point Tacks..... 90 & 25 @ 7 tens  
 Steel Wire Brads, E. & E. Mfg.  
 Co.'s list..... 50 & 10 @ 905  
 See also Nails, Wire.

**Tanks, Oil—**  
 Emerald, S. S. & Co..... 30-gal. \$3.20  
 Emerald, S. S. & Co..... 60-gal. \$4.00  
 Queen City S. S. & Co., 60-gal..... \$3.50  
 Queen City S. S. & Co., 80-gal..... \$4.25

**Tapes, Measuring—**  
 American Ases' Skin..... 40 & 10 @ 505  
 Patent Leather..... 25 @ 30 & 55  
 Steel..... 40 @ 10 & 55  
 Chesterman's..... 25 @ 30 & 55  
 Eddy's Steel..... 40 @ 40 & 55  
 Eddy's Metallic..... 33 1/2 @ 33 1/2 & 55  
 Keuffel & Esser Co., Steel and Metallic,  
 Lower list, 1899..... 355  
 Lurkin's Steel..... 33 1/2 @ 355  
 Lurkin's Metallic..... 30 @ 30 & 355

**Teeth Harrow—**  
 Steel Harrow Teeth, plain or head-  
 ed, base per lb..... 2 1/4 c  
**Thermometers—**  
 Tin Case..... 80 & 10 @ 50 & 10 & 55

**Ties, Bale—Steel.**  
**Single Loop.....**  
 Improved, Monitor, Cross Head,  
 Etc..... 705

**Ties, Wall—**  
 Cleveland Wire Spring Co.:  
 Galv. Steel 5-32 x 6 1/2 in. 1000..... \$10.00  
 Galv. Steel 5-32 x 8 1/2 in. 1000..... \$11.00  
 Galv. Steel 5-32 x 11 1/2 in. 1000..... \$12.00  
 Galv. Steel 5-32 x 15 1/2 in. 1000..... \$14.00

**Tinners' Shears, &c.—**  
 See Shears, Tinnners', &c.  
**Tinware—**  
 Stamped, Japanned and Pleased, sold  
 very generally at net prices.

**Tire Benders, Upsetters,  
 &c.—See Benders and Upset-  
 ters, Tire.**  
**Tobacco Cutters—**  
 See Cutters, Tobacco.

**Tools—Coopers—**  
 L. & I. J. White..... 20 @ 30 & 35

**Atkins' Cross Cut Saw Tools.....**  
 405  
**Simonds' Improved.....**  
 33 1/2  
**Simonds' Crescent.....**  
 255

**Ship—**  
 L. & I. J. White..... 255

**Transom Lifters—**  
 See Lifters, Transom.  
**Traps—Fly—**  
 Balloon, Globe or Acme.....  
 doz. \$1.15 @ 1.25; gro. \$11.00 @ 12.00  
 Harper, Champion or Paragon  
 doz. \$1.25 @ 1.50; gro. \$13.00 @ 15.00

**Oneida Pattern.....**  
 75 & 10 @ 50 & 55  
**Newhouse.....**  
 45 & 15 & 55  
**Hawley & Norton.....**  
 65 & 5 & 85 & 105  
**Victor (Oneida Pattern).....**  
 75 & 75 & 85  
**Star (Blake Pattern).....**  
 60 & 5 & 60 & 105

**Mouse and Rat—**  
 Mouse, Wood, Choker, doz. holes.....  
 85 @ 90  
 Mouse, Round or Square Wire.....  
 doz. \$0.85 @ 1.00

**American Pattern French Rat and Mouse  
 Traps.....**  
 No. 1, Detroit Marty Pattern, \$ doz.  
 \$4.50; in 1/2 gro. lots, \$ doz. \$4.00  
 No. 2, Detroit Marty Pattern, \$ doz.  
 \$3.25; in 1/2 gro. lots, \$ doz. \$3.00  
 Detroit Marty Pattern Mouse, \$ doz.  
 \$2.00; in 1/2 gro. lots, \$ doz. \$1.75  
 Diamond Joe Mouse Traps..... per doz. 605  
 Diamond Joe Rat Traps..... per doz. 110  
 Marty French Rat and Mouse Traps  
 (Genuine).....  
 No. 1, Rat, Each \$1.19 1/4; \$ doz. \$12.00  
 No. 3, Rat, \$ doz. \$6.00; case of 50  
 \$3.25 doz.  
 No. 3 1/2, Rat, \$ doz. \$4.75; case of 72  
 \$4.25 doz.  
 No. 4, Mouse, \$ doz. \$3.50; case of 72  
 \$3.75 doz.  
 No. 5, Mouse, \$ doz. \$3.75; case of 150  
 \$3.25 doz.  
 Schuyler's Rat Killer, No. 1, \$ gr. \$30.00;  
 No. 2, \$ gr. \$30.00; Mouse, No. 3,  
 \$18.00..... 505

**Target—**  
 Markle's, each..... \$5.50

**Trimmers, Spoke—**  
 Bonney's No. 1 and 2..... 405

**Trowels—**  
 Diston Brick and Pointing..... 305  
 Diston Plastering..... 255  
 Diston "Standard Brand" and Ga-  
 ven Trowels..... 405  
 Never-Break Steel Garden Trowels.....  
 670 & 705  
 Peace's Plastering..... \$ gr. \$305  
 Rose Brick and Plastering..... 25 & 55  
 Woodrough & McParlin, Plastering..... 255

**Trucks, Warehouse, &c.—**  
 B. & L. Block Co.:  
 New York Pattern..... 50 & 105  
 Western Pattern..... 60 & 105  
 Handy Trucks..... per doz. \$16.00  
 Daisy Stove Trucks, Improved pattern  
 \$ doz. \$18.50  
 Model Stove Trucks..... \$ doz. \$18.50

**Tubs, Wash—**  
 No. 1 2 3  
 Galvanized, per doz. \$5.00 5.50 6.00  
 Galvanized Wash Tubs (S. S. & Co.):  
 No. 1 2 3 10 20 30  
 Per doz. \$5.25 6.00 6.75 6.50 7.25 8.00

**Twine—**  
**Miscellaneous—**  
 Flax Twine— BC B.  
 No. 9, 1/4 and 1/2-lb. Balls..... 22c 24c  
 No. 12, 1/4 and 1/2-lb. balls..... 18c 20c  
 No. 18, 1/4 and 1/2-lb. Balls..... 16c 18c  
 No. 24, 1/4 and 1/2-lb. Balls..... 15 1/2 c 17 1/2 c  
 No. 36, 1/4 and 1/2-lb. Balls..... 15c 17c  
 Chalk Line, Cotton, 1/2-lb. Balls.....  
 22 @ 22 1/2 c

**Cotton Mops, 6, 9, 12 and 15 lb. to  
 doz.....**  
 7 @ 80  
**Cotton Wrapping, 5 Balls to lb.....**  
 according to quality..... 10 @ 17c  
**American 3-Ply Hemp, 1/4 and 1/2-lb.  
 Balls.....**  
 18 @ 14c  
**American 3 Ply Hemp, 1-lb. Balls.....**  
 18 @ 14c

**India 3-Ply Hemp, 1/4 and 1/2-lb.  
 Balls (Spring Twine).....**  
 8c  
**India 3-Ply Hemp, 1-lb. Balls.....**  
 8c  
**Indian 3-Ply Hemp, 1/4 and 1/2-lb.  
 Balls.....**  
 7c  
 2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls.....  
 9 @ 10c

**Mason Line, Linen, 1/4-lb. Balls.....**  
 15c  
**No. 26, Mattress, 1/4 and 1/2-lb. Balls.....**  
 37c  
**Wool, 3 to 6 ply.....**  
 5c

**Vises—**  
**Solid Box.....**  
 60 @ 50 & 105

**Parallel—**  
 Athol Machine Co.:  
 Simpson's Adjustable..... 405  
 Standard..... 405  
 Amateur..... 255  
 Bonney's..... 405  
 Columbian How Co..... 405  
 Fisher & Norris Double Screw..... 15 @ 105  
 Hollands'.....  
 Machinists'..... 405  
 Keystone..... 65 & 55  
 Lewis Tool Co..... 20 @ 305  
 Massey's Perfect..... 15 @ 205  
 Massey's.....  
 Clincher..... 80 @ 405  
 Combination, Quick Adj..... 405  
 Woodworker's..... 155  
 Merrill's..... 205  
 Miller's Falls..... 50 & 10 @ 105  
 Parker's.....  
 Victor..... 20 @ 255  
 Regular..... 20 @ 255  
 Vulcan's..... 40 @ 455  
 Combination Pipe..... 55 @ 605  
 Prentiss..... 20 @ 255  
 Sargent's..... 405  
 Snediker's X. L..... 20 @ 255  
 Stephens'..... 20 @ 255

**Saw Filers—**  
 Bonney's No. 1, \$13; No. 3, \$16..... 505  
 Diaston's D 3 Clamp and Guide, \$ doz.  
 \$30..... 255  
 Reading..... 605  
 Wentworth's Rubber Jaw, Nos. 1, 2  
 and 3..... 45 & 505

**Miscellaneous—**  
 Bignall & Keeler Combination Pipe  
 Vise..... 605  
 Parker's Combination Pipe:  
 87 Series..... 605  
 187 Series..... 60 & 55  
 No. 870..... 405

**Wads—Price Per M.**  
 B. E., 11 up..... 60c  
 B. E., 9 and 10..... 70c  
 B. E., 8..... 80c  
 B. E., 7..... 80c  
 P. E., 11 up..... \$1.00  
 P. E., 9 and 10..... 1.55  
 P. E., 8..... 1.55  
 P. E., 7..... 1.50  
 Ely's B. E., 11 and larger..... \$1.70 @ 1.75  
 Ely's P. E., 12 to 20..... \$3.00 @ 3.25

**Wagon Jacks—**  
 See Jacks, Wagon.  
**Ware, Hollow—**  
 Aluminum—  
 S. S. & Co. Reduced List..... 405  
**Cast Iron, Hollow—**  
 Stove Hollow Ware:  
 Ground..... 655  
 Unground..... 705  
**White Enamelled Ware:**  
 Maslin Kettles..... 70 & 10 @ 755  
**Covered Ware:**  
 Tinned and Turned.....  
 40 & 10 @ 10 & 10 & 55  
 Enamelled and Plain, 50 @ 50 & 10 & 55  
 See also Pots, Glue.

**Enamelled—**  
 Agate Nickel Steel Ware, list Nov. 1,  
 01..... 50 & 305  
 Iron Clad Ware..... 70 & 105  
 Never Break Enamelled..... 50 & 50 & 105

**Tea Kettles—**  
 Galvanized Tea Kettles:  
 Inch..... 6 7 8 9  
 Each..... 45c 50c 55c 65c

**Steel Hollow Ware.**  
 Avery Spiders & Griddles..... 65 & 55 & 55  
 Avery Kettles..... 905  
 Correlated..... 50 & 50 & 105  
 Never Break Spiders and Griddles.....  
 60 & 55

**Never Break Kettles.....**  
 605  
**Solid Steel Spiders & Griddles.....**  
 65 & 55  
**Solid Steel Kettles.....**  
 605  
**Solid Steel Ware, Enamelled.....**  
 50 & 55

**Washboards—**  
 Solid Zinc..... \$ doz.  
 Crescent, family size, bent frame, \$3.00  
 Red Star, family size, stationary  
 protector..... \$3.00  
 Double Zinc Surface:  
 Saginaw Globe, family size, station-  
 ary protector..... \$2.65  
 Cable Cross, family size, stationary  
 protector..... \$2.90  
 Single Zinc Surface:  
 Saginaw, family size, open back perfo-  
 rated..... \$2.40  
 Saginaw globe, protector, family  
 size, ventilated back..... \$2.25





